A Database Publication

# ATARI USER

Vol. 3 No. 9 January 1988 £1.25



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## Seek and destroy in SUBHUNT

Now on the XE: Return of the Golden Oldies

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Vol. 3 No. 9 January 1988

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*Advertising Sales:*
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**Tel:** 0625 878888 (Editorial)
0625 878888 (Advertising)
0625 879940 (Subscriptions)
**Telex:** 26571 MONREF G
Quoting Ref. 72:MAG001
**Telecom Gold:** 72:MAG001
**Prestel Mailbox:** 614568383
**Fax:** 0625 879966

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# Contents

# Games systems selling well

SALES of Atari's VCS 2600 and XE games/computer systems have been high despite a TV advertising campaign setback.

The problem arose when the Independent Broadcasting Authority objected to an advert scheduled to be shown during prime children's watching time.

One reason given by an IBA spokesman is that the advert put forward by Atari did not comply with its code of practice. The section that Atari seems to have been in breach of states: "Children's ability to distinguish between fact and fantasy will vary according to their age and individual personality.

"With this in mind no unreasonable expectations of performance of toys and games must be simulated by the excess use of imaginary backgrounds or special effects".

By the time Atari had produced another advert to promote its machines for the Christmas market all remaining slots had been sold, leaving the company well and truly out in the cold.

Atari spokesman Peter Walker refused to comment about the ad content or problems with the TV campaign. But he did say that "sales of the games/computer systems are high and do not appear to have been affected by the lack of advertising".

## The very devil to pay over games




HUBBLE bubble toil and trouble for Red Rat Software games Little Devil and Nightmares.

They have been banned in France and Italy because they are considered to have occult connotations. A major UK distributor refused to handle the games in this country for similar reasons.

Red Rat director Harry Nadler told *Atari User*: "I can't understand it, Little Devil is nothing more than a harmless arcade game with no evil intent at all.

"Nightmares contains all the ingredients of a classic fairy tale with no harmful additives or colouring for people to worry about.

"If the games were enticing children to start dabbling with ouija boards or something like that then there could be a justified complaint". Both titles were reviewed in the December issue of *Atari User*.

Niels Reynolds, who reviewed Little Devil, said: "I can see nothing evil in the game at all.

"In fact the opposite situation exists, with the little devil doing good by trying to free lost souls and break out of hell himself".

Silica Distribution had originally banned both games, but has relented in the case of Nightmares.

Their spokesman John Hambley told *Atari User:* "We are now handling Nightmares – but Little Devil remains on our banned list.

"We consider the title unsuitable for general distribution and refuse to stock it for the same reasons as we do not stock Lucifer's Realm, Leather Godesses of Phobos or Strip Poker".

Says Nadler: "The French and Italians and Silica Distribution are all judging the book by its cover – I doubt if any of them have played the games at all".

## Record turnover

**ATARI has achieved record results in the third quarter of its financial year.**

**Sales were $80.4 million – a 34 per cent increase over last year's third quarter when sales totalled $59.8 million.**

**Income was $8.3 million compared to $4.6 million, a rise of almost 80 per cent over last year.**

**Sales for the first nine months stand at $216 million, 30 per cent up on last year's $165 million. Income has risen 76 per cent from $25.8 million to $45.4 million.**

## Weather outlook brighter

THE service which offers Atari users an opportunity to become weather forecasters is being upgraded to a professional standard.

Thanks to WeatherLink, all Atari owners will soon be able to pick up the same satellite pictures as the Met Office experts.

To achieve this, WeatherLink – which operates on the MicroLink system – has switched satellites from the older NOAA 9 to the more advanced Meteosat.

This means that the weather maps transmitted from outer space have been dramatically improved in quality – offering perfect clarity and true colour.

"The problem with NOAA 9 was that it relied on infra red images", said Derek Meakin, head of MicroLink, "and this, at times, resulted in weather maps that lacked clarity and true colour.

"The far more sophisticated Meteosat satellite totally eliminates the problem, enabling Atari owners to download pictures of a completely professional standard".

## News

# Show bargains a big draw

AN in-depth survey of visitors attending the Atari Christmas Show has revealed it was a smash hit with the public.

One hundred per cent indicated not only they felt their attendance had been well worthwhile, but also that they plan to attend the next in the series.

The reason for the mass endorsement stemmed in the main from the vast number of special offers to be found, with a conservative estimate of total discounts available being placed in excess of £100,000.

And such was the competition between exhibitors at the show that some prices fell dramatically during the course of the event.

When the doors opened on the Friday, boxes of 3in discs were selling for £14.95.

By the end of the first day, this had been slashed to £8.50.

"The visitors have had a bonanza", said one major disc supplier.

That's why more than 40 per cent of visitors questioned reported that bargains were the highlight of the show.

Other major reasons given for describing the event as a success were the mix of exhibitors, the range of products, the venue and the overall presentation.

The survey also revealed the spending pattern of visitors to the show. Some 40 per cent spent up to £25, 26 per cent up to £50, a further 12 per cent up to a £100, with 22 per cent paying out more than £100.

"It was fantastic", said Atari user Donald Peterson. "I've travelled down from Bradford for the day and I reckon I've saved not only my fare but also more than £150 in special offers".

## *Olympic competition*

WITH the winter Olympics poised to grace our television screens, Tynesoft has released Winter Olympiad 88 for the Atari XL and XE.

As well as being able to take part in the simulated sporting action which includes downhill racing, bobsleigh, slalom, ski jump and biathlon, Tynesoft (091-414 4611) is running a competition with a trip for two to the winter Olympics in Calgary as the star prize.

The competition, which closes on January 30, is open to all purchasers of Winter Olympiad 88 and requires you to place in order the eight most important qualities which are needed by a top alpine skiing star.

Leading TV winter sports commentator David Vine contributed to a free booklet which is included with the game. Price £9.95 on cassette and £14.95 on disc.

## Schematics software

A PACKAGE designed to complement word processing software has been announced by Agamemnon (0273 417370).

Print Marshal – which requires 64k ram, disc drive and a dot matrix printer – allows the user to produce flow charts, circuit diagrams, club magazines, sheet music and anything of a schematic nature.

The program also mixes graphics with text and turns the computer into a 40 column by 20 row window of an 80 column by 80 row document page which can be scrolled around.

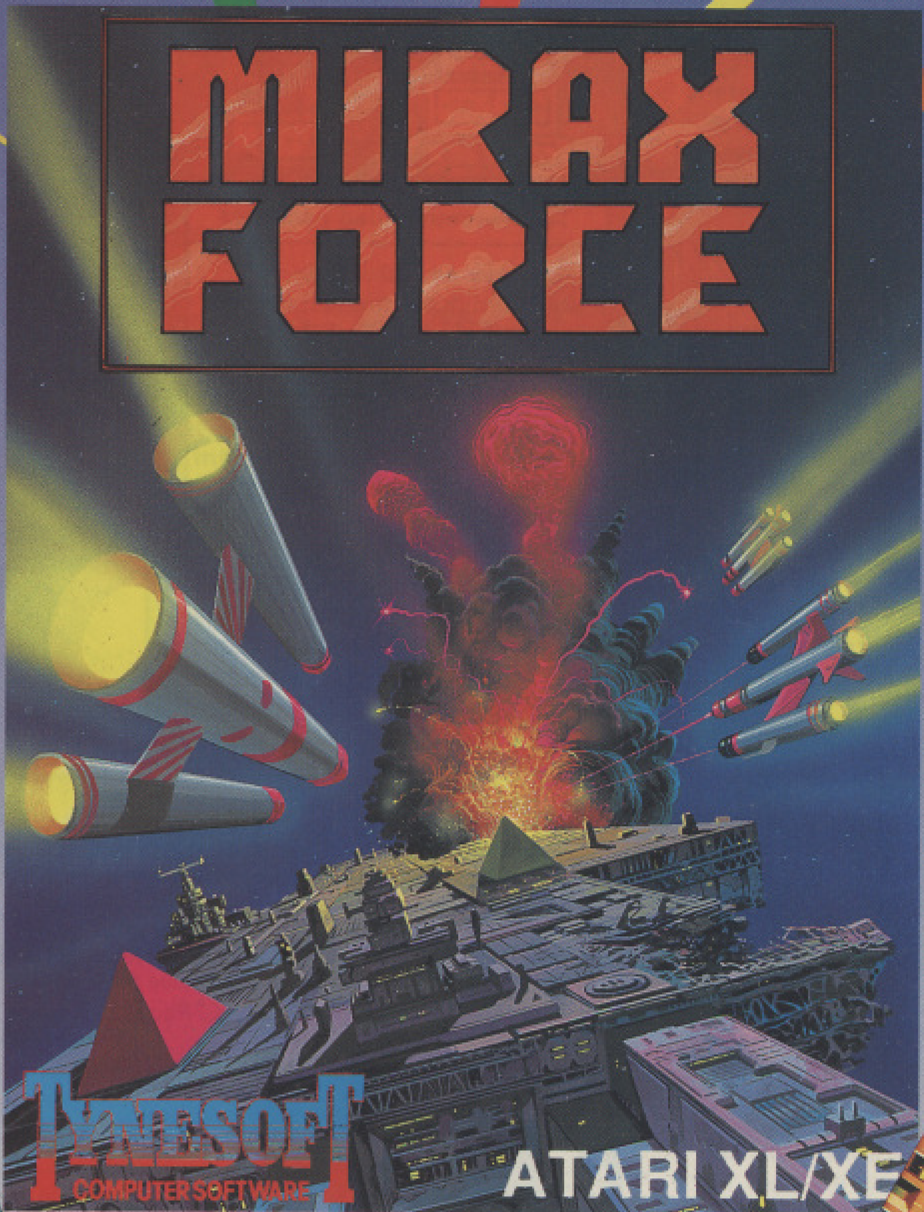
## THE GALLUP CHART TOP 20 ATARI SOFTWARE

| THIS MONTH | LAST MONTH | TITLE (Software House) | PRICE |
|---|---|---|---|
| 1 | 1 | DECATHLON *Firebird* | 1.99 |
| 2 | 2 | FEUD *Mastertronic* | 1.99 |
| 3 | • | HENRY'S HOUSE *Mastertronic* | 1.99 |
| 4 | 3 | 180 *Mastertronic* | 2.99 |
| 5 | • | PANTHER *Mastertronic* | 1.99 |
| 6 | 8 | ON CUE *Mastertronic* | 2.99 |
| 7 | • | SOCCER *Alternative* | 1.99 |
| 8 | 12 | SILENT SERVICE *Microprose* | 9.95 |
| 9 | 17 | FOUR GREAT GAMES *Micro Value* | 3.99 |
| 10 | • | TALLADEGA *Top Ten* | 2.99 |
| 11 | 7 | MILK RACE *Mastertronic* | 2.99 |
| 12 | 11 | STORM *Mastertronic* | 1.99 |
| 13 | 10 | LEADERBOARD *Access/US Gold* | 9.95 |
| 14 | • | BMX SIMULATOR *Code Masters* | 1.99 |
| 15 | 5 | GAUNTLET *US Gold* | 9.95 |
| 16 | 4 | DIZZY DICE *Players* | 1.99 |
| 17 | 20 | FOUR GREAT GAMES 2 *Micro Value* | 3.99 |
| 18 | 15 | BOULDER DASH II *First Star/Prism* | 2.99 |
| 19 | • | KNOCKOUT *Midas* | 2.99 |
| 20 | • | GUN LAW *Mastertronic* | 1.99 |

*Compiled by Gallup/Microscope*

There are four new entries this month, all in the Top Ten. While three games re-enter lower down the chart. Mastertronic's budget range is well represented with four in the Top Five – the first place still eluding them, as Decathlon from Firebird seems unmoveable.

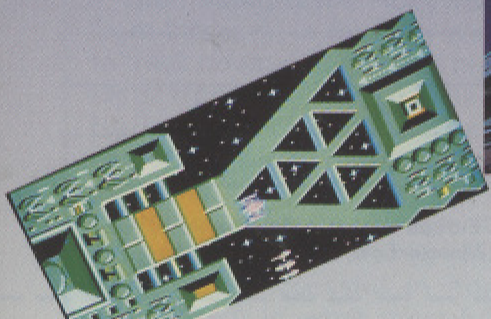
# THE ULTIMATE SHOOT THEM UP!

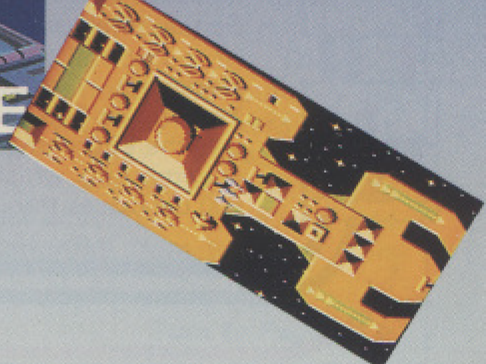



Delta Base to Star Quest - Priority Despatch - Code Red. Your mission is to fly Star Quest over the Alien Mothership, destroying as much of it as possible with the ultimate goal being the Main Ship's Reactor.

Your flight will be hazardous whilst avoiding tall pylons, buildings and shadowed objects. You will come under intense attack from waves of well-equipped Defender Ships protecting the Mothership.

R.R.P. Cassette £7.95
Disk £9.95





Tynesoft Computer Software,
Addison Industrial Estate,
Blaydon, Tyne & Wear
NE21 4TE
TEL: (091) 414 4611

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# MicroLink



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**Tele-booking** – Reserve train and theatre tickets, check flight details worldwide, or order from a vast range of products – from flowers to floppy discs.

**Telesoftware** – Download directly into your Atari any program from the ever-growing library now available on MicroLink – both games and utilities.

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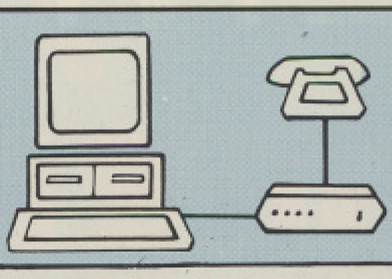
**Translation** – Access the biggest and most up-to-date multi-lingual dictionary in the world, with over 380,000 words.

**News** – Use the powerful search commands to pinpoint vital business information from the world's leading news services, newspapers and periodicals.

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All you need – apart from your Atari – is a modem, which plugs into your telephone wall socket, plus suitable communications software.

We have provided two possible options on the left.

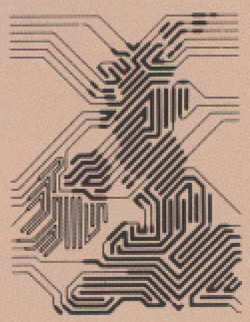
Whichever equipment you use, you will be able to call MicroLink, open your mailbox, save to disc any messages waiting for you, and disconnect in as little as two minutes.

**Two recommended packages**

***If you have an 850 interface:***
Pace Nightingale manual modem + cable (£116.15) PLUS Mini Office II (£19.95).
*Total price: £136.10.*

***If you don't have an interface:***
Miracle WS2000 V21, V23 modem + Datatari interface + cable + Datatari software.
*Total price: £149.95.*

With either combination you can also log on to other databases and bulletin boards all round the world.



**More than 90 per cent of subscribers can connect to the MicroLink computer at local call rates.**

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Please send me full details about MicroLink, and information sheets about the following hardware and software options (please tick):

☐ Pace package ☐ Miracle package

Name____________________

Address____________________

____________________

Postcode____________________

**Send to: MicroLink, Europa House, Adlington Park, Adlington, Macclesfield SK10 5NP.**

ATU1

# Ravings from a year of plenty

by Rouloc



**EVERY month I wonder if I'm going to have enough time to write this column. What with freeing kingdoms held in tyranny's thrall by power-crazed sorcerers, rescuing damsels trapped in high towers and hacking my way through deep jungles to bring back the lost blue pearl of the Pimpopo tribe, I reckon I have my work cut out. And that was only yesterday!**

Still, I've managed to make it in one piece yet again. Looking back over the year, it seems that not a day passed when I wasn't being baffled, bamboozled or landing myself in a pretty pickle or dire dilemma. And the same must apply to you if you've played all the adventures that have been covered in these pages during that time. This month I'm taking the opportunity to cast my mind back over some of the adventures that stood out in 1987.

Remember Rick Hanson from Robico Software? – a meaty text adventure if ever there was one. Special Agent Rick, a tough guy who feared nothing but spiders, was set the task of stopping some loony general from wiping out the world. Did Rick succeed? Well, only you can answer that if you've played the adventure. If you've not tried it, I strongly recommend it to you – it's a good 'un.

Then along came Hollywood Hijinx from Infocom. In this you were forced to track down a number of bizarre artifacts from your late Uncle Buddy's Hollywood mansion. There were some really way-out scenes in Hijinx, as I recall.

Did you manage to solve the multi-step puzzle of the atomic chihuahua? Were you successful in finding the buried item in what must have been the biggest maze ever in an adventure? And incidentally, don't you think mazes are a bit of a pain? It's about time they were dropped from adventures – to me they are just time wasters.

And what about that beginning in Hollywood Hijinx? What a stinker! I can't think of too many adventures where even getting started had the old grey matter going into overdrive. But how satisfying when at last the penny dropped and you found the way to get into the mansion.



Next up was Brimstone, an unusual text adventure in the Electronic Novel series from Broderbund, courtesy of US Gold. Although the screen layout on this adventure was a shade uninspiring, the contents more than made up for it.

These Electronic Novels have perhaps been a bit neglected by most adventurers and they certainly have not been given the publicity by their distributors that the products deserve.

That is a pity, because these games are very good. The parser is impressively sophisticated, on a par with Infocom's and Magnetic Scrolls', and there are many innovations in the adventures. The text is fulsome and the plots gripping and atmospheric.

If you've never tried an Electronic Novel, I should waste no time in getting your hands on one. They are not cheap – around £25 – but they are worth every penny. Others in the series are Essex, Breakers and Mindwheel – they are all a joy to play.

The best adventure of the year had to be Stationfall from Infocom. This

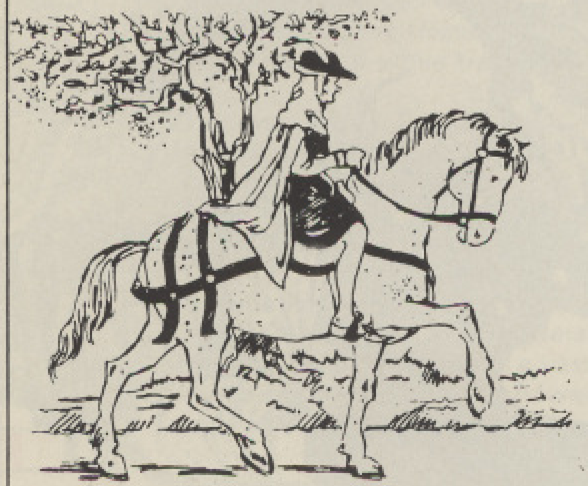
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featured the return of Floyd, that lovable little robot you first encountered in Planetfall. Stationfall contained superb puzzles, many very funny incidents – the windy Arcturian balloon creature immediately springs to mind – a teasing plot and quite the best ending I've come across.

Talk about bringing tears to the eyes – why, there wasn't a handkerchief in our house that wasn't sopping! Stationfall wins my vote as one of the best adventures ever written.

Running a close second was the eagerly awaited Magnetic Scrolls' Guild of Thieves from Rainbird, the dazzling follow-up to The Pawn. In



several ways, Guild is the better of the pair. It has the same excellent parser, good textual descriptions and high quality graphics that The Pawn has, but the story is much more tightly plotted and consistent.

The puzzles are more logical and there is the added touch of the Master Thief's humorous appearances at different points in the game. Guild of Thieves has won several awards already including PCW Adventure Of The Year and looks like remaining a steady seller for a long time to come.

To conclude my review of some of the highlights of '87, there was Lurking Horror (Infocom) and Knight Orc (Rainbird/Level 9). Both started off promisingly but turned out to be a little disappointing.

Lurking Horror had one or two illogicalities and was somewhat overrated as a horror story – it turned out to be rather tame. Knight Orc was a major step forward for Level 9 but the first part – there are three sections in the game – was sprawling, overpopulated and somewhat unsatisfying. Even so, both adventures fully earned their place in any dedicated adventurer's collection.

You'll note that many adventures these days are for disc owners only. That's hard luck on those who only have cassette decks but I'm afraid that's the trend with adventures. Scrimp and save every penny to get a disc drive is my advice – you're missing out on a lot of pleasure without one.

For a bit of fun, I am giving you my list of the best Atari adventures. I hope you will find some there that you can agree with but if not, why not write in and tell me what your own favourites are? I'll publish such lists from time to time – there's nothing like airing your own views for getting a good argument going!

## RUOLOC'S RAVES

| | |
|---|---|
| 1 | Stationfall (Infocom) |
| 2 | Guild of Thieves (Rainbird) |
| 3 | Hitch Hiker's Guide to the Galaxy (Infocom) |
| 4 | Jewels of Darkness Trilogy (Rainbird/Level 9) |
| 5 | Pirate Adventure (Scott Adams Adventure International) |
| 6 | Suspect (Infocom) |
| 7 | Zork I (Infocom) |
| 8 | The Pawn (Rainbird) |
| 9 | Circus (Mysterious Adventures) |
| 10 | Lords of Kharma (Avalon Hill) |
| 11 | Adventureland (Scott Adams) |
| 12 | Rick Hanson (Robico) |
| 13 | Ballyhoo (Infocom) |
| 14 | Sorcerer (Infocom) |
| 15 | The Worm in Paradise (Level 9) |
| 16 | Mordon's Quest (Melbourne House) |
| 17 | Zork II (Infocom) |
| 18 | Zork III (Infocom) |
| 19 | Sorcerer of Claymorgue Castle (Scott Adams) |
| 20 | Spellbreaker (Infocom) |

## Hints & tips

And so lastly to a few of the letters received. My belated thanks to Simon Cantrill (aged 12) of Stourport for his superb map of Mercenary, The Second City. Not in the traditional mould of adventures, I know, but a splendid game for all that.

Martin Tee would like some help with Golden Baton. He can't find a lamp and cannot defeat the knight on the battlements. It's a long time since I played this one and I've lost my solution documents.

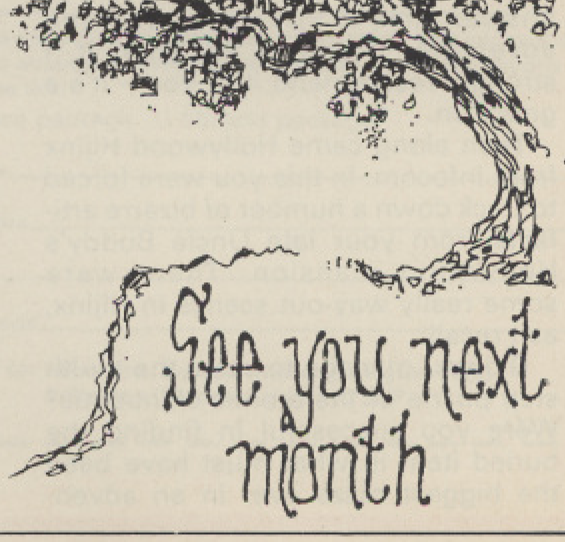
I think the lamp is inside the castle somewhere – perhaps you can find it after overcoming the knight? I seem to remember that you also have to make yourself invisible – maybe that's how you get past the knight. Can anyone say for certain?

For Andrew Tonge of Leeds and other readers still troubled by The Payoff, let me advise you to beg, buy or borrow the April 1987 issue of *Atari User*, where a complete solution appeared.

Andrew would also like some assistance with Earthquake. He has got to the fire blocking the path and has been down the drain but can't make any further progress. Who can help this adventurer in distress?

From Cwmbran, A.M. Norris and party have reached level 8 in Ultima IV but can't find the mandrake. Another problem is in entering the codex (after the abyss sanctum) – they are unable to get the symbols of the word of passage in order. Advice is required from other Ultima IV players, please.

And so until next month, I bid you all a fond farewell. Have a happy new year and may all your treasures be non-rusting!



# Let's get one of the three Rs right!

## PETER WATTS fills an educational gap with a simple maths test

**NOT enough emphasis is placed on basic numerical skills in schools today – youngsters should know their multiplication tables and be reasonably competent at addition and subtraction.**

This easy-to-use program can be fun and educational for kids of any age, and even adults may wish to test their knowledge of rudimentary maths.

When the routine is first run you are asked for your name, followed by a menu screen offering different types of arithmetic problems – or you can have a random selection of each. After this you are asked for the difficulty level – 1 to 12 – which can be changed by pressing the Select key.

When you press the Start key 10 questions will appear one at a time, and the timer is started. You are allowed three attempts at each and if the last answer you give is incorrect you will be given the correct one.

Although the test is timed, there is no time limit and your final score depends on the attempts taken at a given question – 10 marks are given for a correct answer at the first attempt, six for the second and two for the third.

At the end your score, the time taken and the fastest time is displayed. If you score more than 89 the level of difficulty is increased by one if you choose the same type of problem again.

The questions are generated by random numbers – *X* and *Y* – generated in lines 110, 120, 210, 220, 310, 320, 410 and 420. These can easily be modified to change the degree of difficulty.

```
1 REM FUN WITH MATHS
2 REM BY PETER WATTS
3 REM (c)ATARI USER
5 DIM N$(10),TXT$(20),Z$(5):HJIF=30000
:OPEN #2,4,0,"K:"
10 GRAPHICS 17:SETCOLOR 3,7,8:POSITION
 2,0:? #6;"****************    *fun wi
th maths*    ****************"
15 POSITION 3,8:? #6;"TYPE YOUR NAME":
POSITION 3,10:? #6;"AND HIT RETURN"
20 POSITION 5,17:? #6;"----------":POS
ITION 5,16:TRAP 35
25 GET #2,K:IF K=155 THEN 35
30 N$(LEN(N$)+1)=CHR$(K):? #6;CHR$(K);
:GOTO 25
35 POSITION 5,5:? #6;"C H O O S E":POS
ITION 2,8:? #6;"1. addition"
40 POSITION 2,10:? #6;"2. subtraction
":POSITION 2,12:? #6;"3. multiplicatio
n"
45 POSITION 2,14:? #6;"4. division":PO
SITION 2,16:? #6;"5. mixed problems"

50 L=1:GET #2,K:S=K-48:IF S<1 OR S>5 T
HEN 50
55 IF PEEK(53279)=5 THEN SOUND 0,150-5
*L,14,7:L=L+1:IF L>12 THEN L=1
60 POSITION 2,19:? #6;"select = LEVEL
";L;" ":POSITION 0,22:? #6;"PRESS star
t TO BEGIN"
65 FOR T=1 TO 25:NEXT T:SOUND 0,0,0,0
70 IF PEEK(53279)<>6 THEN 55
75 GRAPHICS 17:SETCOLOR 0,1,6:SETCOLOR
 2,12,8:SETCOLOR 4,0,10
80 DLIST=PEEK(560)+PEEK(561)*256:POKE
DLIST+6,7:POKE DLIST+15,7:POKE 19,0:PO
KE 20,0
85 SC=0:FOR I=1 TO 10:TRY=0
90 IF S<>3 THEN POSITION 5,4:? #6;"LEV
EL = ";L
95 POSITION 0,1:GOSUB S*100:POSITION 6
,20:? #6;"SUM NO.";I:GOSUB 900:NEXT I:
GOTO 600
100 ? #6;"   ** ADDITION **
110 X=INT(11*RND(0)*L)
120 Y=INT(11*RND(0)*L)
130 POSITION 5,10:? #6;X;"+";Y;" ="
140 A=X+Y:RETURN
200 ? #6;"  ** SUBTRACTION ** "
210 X=INT(12*RND(0)*L+1)
220 Y=INT(10*RND(0)*L)
225 IF Y>X THEN 220
230 POSITION 5,10:? #6;X;"-";Y;" ="
240 A=X-Y:RETURN
300 ? #6;"** MULTIPLICATION **"
310 X=INT(RND(0)*13):Y=L
320 IF S<>5 THEN POSITION 4,4:? #6;L;"
 TIMES TABLE"
330 POSITION 3,10:? #6;X;" X ";Y;" ="
340 A=X*Y:RETURN
400 ? #6;"   ** DIVISION **
410 Y=INT(9*RND(0)+L)
420 X=Y*INT(8*RND(0)+L)
430 POSITION 4,10:? #6;X;"/";Y;" ="
440 A=X/Y:RETURN
500 N=INT(RND(0)*4+1):GOTO N*100
600 REM END ROUTINE
610 GRAPHICS 17:SETCOLOR 0,2,8:SETCOLO
R 1,1,8:SETCOLOR 2,8,6:SETCOLOR 3,12,8
620 JIF=256*PEEK(19)+PEEK(20)
630 MIN=INT(JIF/3000):SEC=INT((JIF-MIN
*3000)/50)
640 IF JIF<HJIF THEN HJIF=JIF:HMIN=MIN
:HSEC=SEC
650 POSITION 2,0:? #6;N$;"S TAKEN"
660 POSITION 3,2:? #6;MIN;" MINS ";SEC
;" SECS"
670 POSITION 4,9:? #6;"fastest time"
680 POSITION 3,11:? #6;HMIN;" MINS ";H
SEC;" SECS"
700 IF SC<40 THEN TXT$=" replace brain
 cells"
710 IF SC>40 THEN TXT$="     try harde
r
720 IF SC>69 THEN TXT$="      very goo
d
730 IF SC>89 THEN TXT$="    what a wiz
```

Turn to Page 12 ►

### PROGRAM BREAKDOWN

| | |
|---|---|
| 10-45 | Title screen |
| 50-70 | Select problem and level |
| 75-80 | Question screen and change list |
| 85-95 | Main program loop |
| 100-140 | Subroutine for addition |
| 200-240 | Subroutine for subtraction |
| 300-340 | Subroutine for multiplication |
| 400-440 | Subroutine for division |
| 500 | Random selection of problems |
| 600-795 | End routine |
| 900-990 | Get and print pupil's answer |
| 1000-1060 | Routine for correct answer |
| 2000-2090 | Routine for incorrect answer |

### VARIABLES

| | |
|---|---|
| Z$ | Pupil's answer |
| L | Level of difficulty |
| S | Problem selected |
| SC | Score |
| I | Problem number |
| TRY | Number of attempts at a question |
| X,Y | Random numbers chosen for problems |
| A | Correct answer |
| JIF,HJIF | Timing variables |

◄ *From Page 11*

```
ard
740 POSITION 0,16:? #6;TXT$:POSITION 2
,21:? #6;"WANT ANOTHER GO ?":POSITION
7,23:? #6;"(Y/N)"
750 POSITION 5,5:? #6;"SCORE = ";SC:FO
R T=1 TO 120:NEXT T
760 POSITION 13,5:? #6;"    ":FOR T=1 T
O 60:NEXT T
770 IF PEEK(764)=255 THEN 750
780 GET #2,K:IF K=78 OR K=110 THEN 10
790 IF SC>89 THEN IF S<>3 THEN L=L+1
795 GOTO 75
900 REM GET AND CHECK ANSWER
910 POSITION 13,10:? #6;"?
920 POSITION 13,10:Z$=" ":DIGIT=1:POKE
 764,255
930 IF A>9 THEN DIGIT=2
940 IF A>99 THEN DIGIT=3
950 FOR N=1 TO DIGIT
960 GET #2,K:IF K=126 THEN 900
970 IF K<48 OR K>57 THEN 960
980 PUT #6,K:Z$(N,N)=STR$(K-48):NEXT N
990 IF A<>VAL(Z$) THEN TRY=TRY+1:GOTO
2000
1000 REM CORRECT ANSWER
1010 POSITION 2,15:PRINT #6;"answer is
 correct"
1020 FOR T=200 TO 3 STEP -3:SOUND 0,T,
10,10:POKE 711,T+17:NEXT T:SOUND 0,0,0
,0
1030 FOR T=1 TO 100:NEXT T
1040 POSITION 0,15:? #6;"
"
1050 POSITION 0,10:? #6;"
"
1060 SC=SC+10-4*TRY
1070 RETURN
2000 REM INCORRECT ANSWER
2010 IF TRY<>3 THEN POSITION 1,15:? #6
;"INCORRECT TRY AGAIN"
2020 IF TRY=3 THEN POSITION 2,15:? #6;
"THE ANSWER IS ";A
2030 FOR T=1 TO 45:SOUND 0,95,12,8:NEX
T T:FOR T=1 TO 50:SOUND 0,85,12,8:NEXT
 T:SOUND 0,0,0,0
2040 FOR T=1 TO 100:NEXT T:POSITION 0,
15:? #6;"
2050 IF TRY<>3 THEN 900
2060 POSITION 13,10:? #6;A
2070 FOR T=1 TO 10:SOUND 0,50,8,12:NEX
T T:SOUND 0,0,0,0:FOR T=1 TO 300:NEXT
T
2080 POSITION 0,10:? #6;"
"
2090 RETURN
```

## Get it right!

| | | |
|---|---|---|
| 1 CAJ (W) | 55 XSQ (R) | 140 WK4 (J) |
| 2 CAK (3) | 60 QL5 (W) | 200 P61 (K) |
| 3 CAL (V) | 65 AFP (H) | 210 3LM (T) |
| 5 RSO (G) | 70 KXN (H) | 220 3DX (5) |
| 10 TRD (U) | 75 QRU (T) | 225 7LM (L) |
| 15 2FU (K) | 80 C1A (F) | 230 OO5 (R) |
| 20 7QK (J) | 85 RWQ (X) | 240 WK9 (V) |
| 25 HG5 (S) | 90 LWU (J) | 300 7PL (W) |
| 30 K69 (U) | 95 86M (J) | 310 7CY (Y) |
| 35 V5V (D) | 100 8UN (2) | 320 41S (U) |
| 40 TAL (E) | 110 39E (G) | 330 Y2Q (O) |
| 45 EUP (6) | 120 3EW (L) | 340 WK4 (C) |
| 50 JR3 (V) | 130 YV4 (T) | 400 ALC (A) |

| | | |
|---|---|---|
| 410 3JH (3) | 740 KHX (P) | 1010 EX7 (W) |
| 420 9C9 (G) | 750 DL1 (J) | 1020 9Y9 (W) |
| 430 O3Y (A) | 760 N58 (R) | 1030 N9X (6) |
| 440 WKG (D) | 770 LUL (R) | 1040 4TW (O) |
| 500 PG3 (K) | 780 4HW (1) | 1050 48W (4) |
| 600 CUX (U) | 790 3F4 (T) | 1060 AE2 (K) |
| 610 ROQ (M) | 795 QWE (G) | 1070 VRK (P) |
| 620 J15 (1) | 900 CV1 (9) | 2000 CXP (L) |
| 630 QJR (Q) | 910 PUD (P) | 2010 YF1 (Y) |
| 640 2C9 (6) | 920 RUS (D) | 2020 9AX (H) |
| 650 29D (S) | 930 D3E (C) | 2030 MHQ (F) |
| 660 S2O (3) | 940 CYL (X) | 2040 KL4 (2) |
| 670 MYA (L) | 950 AUH (Y) | 2050 GPX (3) |
| 680 FSE (6) | 960 PMM (1) | 2060 MHP (H) |
| 700 MQS (A) | 970 LJG (L) | 2070 Q77 (Q) |
| 710 KFT (U) | 980 7G8 (D) | 2080 4FX (L) |
| 720 H9V (H) | 990 QY2 (U) | 2090 VVL (Q) |
| 730 H1R (J) | 1000 CXN (W) | |

# You win some ...

*Product: 4 Star Compilation: Volume 2.*
*Price: £7.95 (cassette) £9.95 (disc)*
*Supplier: Red Rat Software, 11 Fennel Street, Manchester M4 3DU.*
*Tel: 061-835 1055*

WHENEVER I see a compilation I am always a little dubious about the quality of the software but with this package two of the four are good. Let's look at them individually:

If you ever play arcade games you will recognise **Screaming Wings** as a clone of 1942. Basically you take on the role of a lone pilot and single-handedly take on an entire Japanese airforce.

Your aircraft is a Lockheed Lightning and you take off from the carrier where you are based at the beginning of each level. If you survive you must return there to land.

By shooting certain aircraft you can gain extra firepower or a destructor smart bomb which is operated by the spacebar.

Some of the enemy aircraft take a bit of killing and the large bomber simply refuses to exlode. If you get into trouble then simply loop the loop and escape the danger.

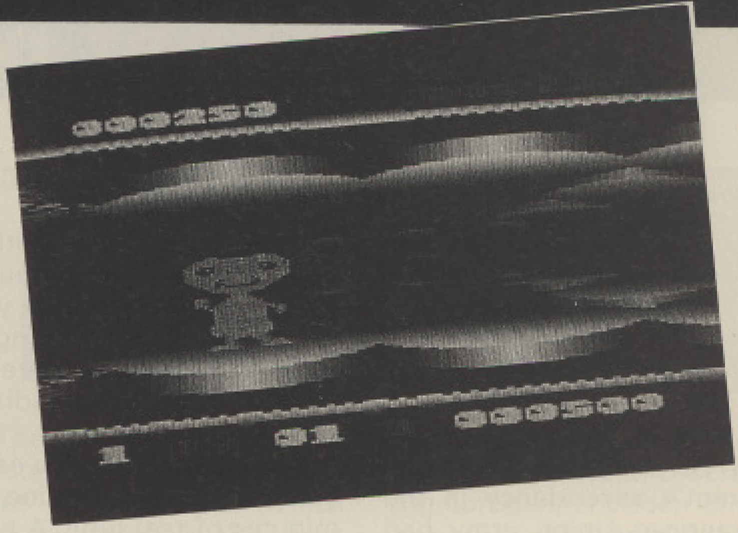
The graphics are acceptable – except for the aircraft which are rather uninspiringly designed.

Play is quite addictive despite the niggles and the one feature that really saves the day is the smooth and efficient screen scrolling. Screaming Wings is the best on the compilation and should give you hours of fun.

In **Crumble's Crisis** you are Crumble, and work in the intergalactic zoo.

Last night when you were locking up you didn't set the time locks on the Fuzzies' cages properly and they have now escaped – all 30 of them.

So away you go with your jet-pack to bring them all back. There are six Fuzzies on each of the five levels and all you have to do is go up to them and pop them into the cage.






Luckily for you they are all relatively harmless. However there are other nasties: Ghosts, goblins and evil weevils.

If you start to get low on energy, just look for the knives and forks that will replace it but be careful not to touch the walls as they are made of anti-matter and make a bit of a mess if touched.

The graphics are well done and the game is fun to play, so if you fancy going Fuzzie hunting this is for you.

I have read some strange introductions for games in the past, but the one for **Disc Hopper** is superb: "Zlotzi has been stranded by the mothership on a strange alien world 50,000 par secs away from his home planetary system of Bright Antares. His only hope of survival is to Disc Hop home. This involves riding the sub-etheric discs across the intergalactic spatial interstices" Did you get all that?

Your object is to advance through as many screens as you can collecting points avoiding the slimies and the molecular disintegrator as you go.

You can be killed in any number of ways, but in the process of playing the game I couldn't keep track of what killed me or when or how it happened. Extra lives are obtained by hopping on to a diamond shape – but only on certain screens – and then hopping off quickly.

The game has a few curious features which include cheat pods – diamonds with a circle around them. If you stand on one of these and press fire you will go to the next level.

Though original, this game did not have much else going for it.

The concept of **The Search** is to retrieve a magic ring hidden somewhere in the frozen wastes. You have to return it to the blue castle from where you set out.

Control is by joystick and in the process of playing you will encounter different characters. When this occurs you are offered four courses of action: Flee, attack, greet or bribe.

There are various objects that you can find to help you in your quest. The game also has a save feature that will allow you to store your programs on tape or disc.

Yet as far as graphic adventures go this one suffers from both poor graphics and sound.

Few compilations contain games of equal value and this is no exception. However, for the price this Four Star Compilation does give you your money's worth.

**Neil Fawcett**

| | |
|---|---|
| *Sound* | *6* |
| *Graphics* | *7* |
| *Playability* | *6* |
| *Value for money* | *8* |
| *Overall* | *7* |

# What a great battle it was ...

*Program: Shiloh – Grant's Trial in the West*
*Price: £19.99*
*Supplier: SSI/US Gold, Units 2/3 Holford Way, Holford, Birmingham BS 7AX.*
*Tel: 021-356 3388*

UNTIL April 1862, General Grant's ascendency in the American Union army had been relatively uneventful. But then came that fateful dawn when he and his 45,000-strong force was caught in a surprise attack by Confederate General Johnston and his army of the Mississippi.

So began the Battle of Shiloh – two days that were to prove Grant's first real trial by fire.

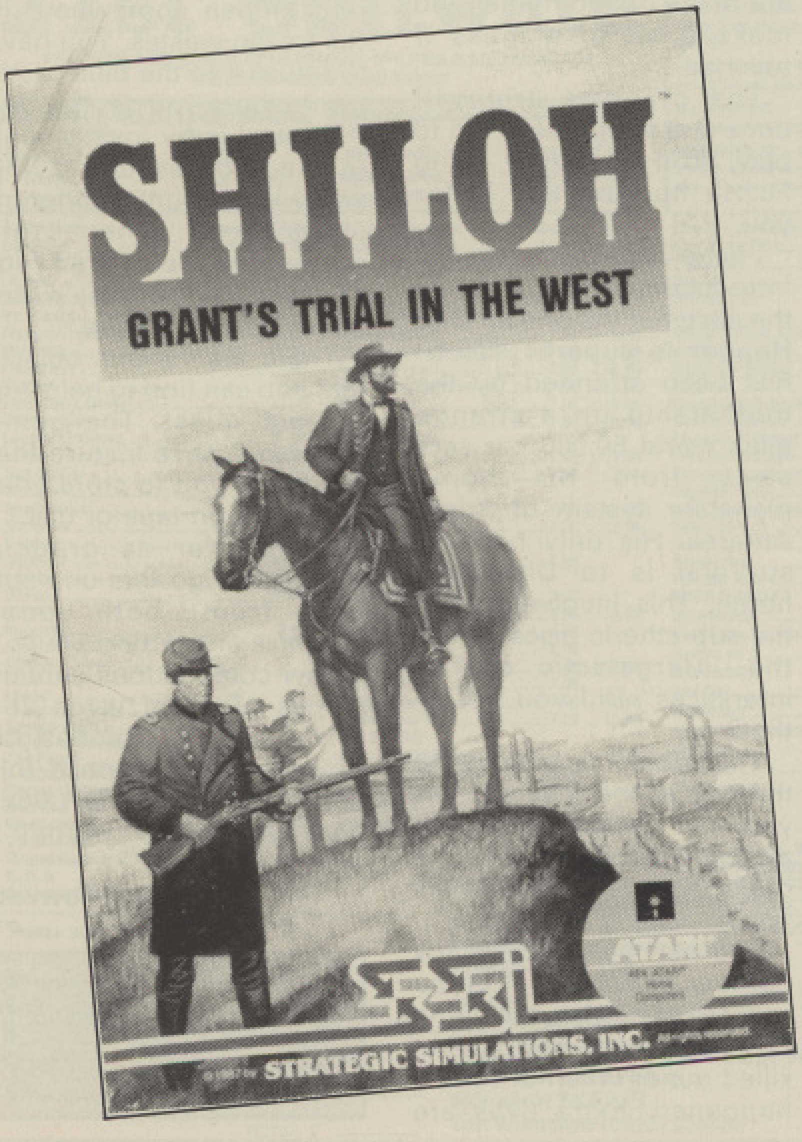
In this latest wargame from experts Strategic Simulations, you have the chance to determine the outcome of this historic battle in the American Civil war.

Taking command of either army against the computer or a human opponent, you have the choice of playing at any of three levels: Introductory, intermediate or advanced.

There are 15 turns in each game, each representing 90 minutes of real time. A turn is made up of a number of phases which are played out over a two-level, 30 x 30 square-gridded, scrolling map of the battleground.

The terrain includes light and heavy woods, clearings, roads, ridges, creeks, ravines, swamps, orchards, streams, a ford, river, a sunken road and Shiloh Church.

The map can be viewed from long range – giving a strategic view of the whole battlefield – or you can zoom in to have a tactical look at an enlarged smaller area.




There are four types of unit used: Infantry, cavalry, gun boats and artillery. Each of these is rated for manpower – including guns if artillery – efficiency, morale, fatigue, weapon type, ammunition, and other factors. The units are distinguished on screen by specific shapes and colours.

At the intermediate and advanced levels, the phases, in order of play, consist of command control, recovery or rally, reinforcement, followed by two sets of Confederate and Union operations and combat phases, with a mid-point recovery phase intervening and culminating in a victory determination phases.

On the eighth turn only, an end-of-day phase also comes into play.

Each phase offers a wide variety of options and the game is extremely flexible in play. It is not possible in a short review to do justice to the range of options, parameters and commands available and to the depth and complexity – and hence realism – of Shiloh.

But just to give you a flavour of the intricacies, let me list a few of the options open to you: You can elect to have certain units hidden from view, only becoming visible when moved adjacent to during an operation phase. This is particularly recommended if you want to realistically portray the fog of war.

Within any of the three overall complexity levels, you may pick from any of five difficulty levels. Level three is historical and makes no modification to either side.

The other levels affect the casualties inflicted in combat – one and two favour the Confederate player, four and five the Union.

Ammunition supply, the efficiency of the units and the arrival of Union reinforcements may be varied and you can choose between a one- or the full two-day campaign.

In addition, a comprehensive range of commands allows the player to, among other things, display help menus, save and load games, toggle between tactical and strategic maps, remove units to view the underlying terrain, centre the map around a unit, build a level of fortification, and view all squares that the designated unit can fire into – the list goes on and on.

The game's algorithms are many and complex too. For example, each leader has a bonus rating that is modified randomly each turn. The effect this has is to make that command confused, indecisive, cautious or confident and this in turn affects the units.

Fortunately, the accompanying documentation, in the form of a glossy 60-plus page booklet, clearly sets out the instructions, background, complexities and ramifications.

The game is supplied in an attractively illustrated box and comes complete with a stiff map of the battlefield on the reverse of which is a handy reference guide.

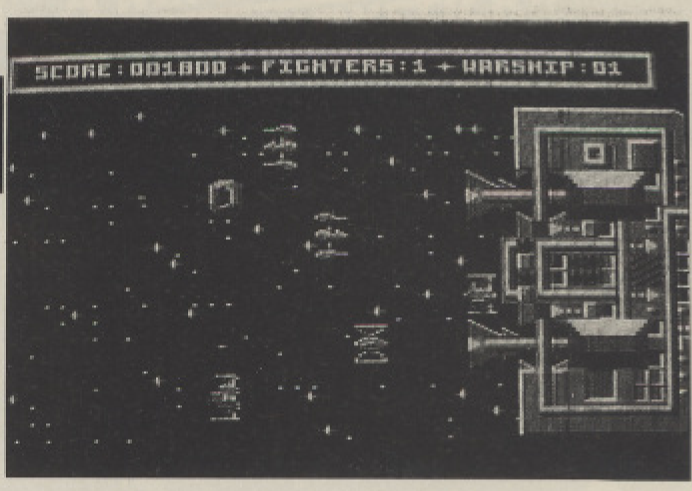
Shiloh is sure to be greeted with delight by all wargaming fans. It is flexible enough for beginners to play at a fairly basic level but true sophistication and challenge really becomes apparent at the higher levels.

This is one that you can turn to again and again and represents excellent value for money. A must for all afficionados.

**Bob Chappell**

| | |
|---|---|
| *Documentation* | 9 |
| *Graphics* | 7 |
| *Playability* | 9 |
| *Value for money* | 9 |
| *Overall* | 9 |

# Star rating




*Product: Mirax Force*
*Price: £7.95 (cassette) £9.95 (disc)*
*Supplier: Tynesoft, Addison Industrial Estate, Blaydon, Tyne and Wear NE21 4TE.*
*Tel: 091-414 4611*

"ALERT...Alert, Delta Base to Star Quest – Priority Despatch – Code Red..Code Red....". Thus begins Mirax Force – one of the best games to appear for a long time.

Your mission is to fly Star Quest, your super star fighter, over the gigantic alien mothership, destroying as much of the main superstructure as possible.

Your goal is to annihilate the ship's main reactor. This sounds straightforward, but isn't and it beat me.

As you attempt to destroy the mothership you are constantly buzzed by the defence fighters. These small craft attempt to eliminate you with monotonous determination – even if their missiles miss the enemy will ram you.

As well as avoiding the fighters you must negotiate tall pylons, buildings and shadowed objects. This addition makes the game extremely taxing.

The inlay card outlines one of the features as very smooth bi-directional scrolling, but to the common mortal this means that the screen scrolls from left to right in a fashion very similar to Defender.

The graphics are superb, the colours expertly used and together they make a stunning display. Intricate design work adds to the overall quality and style and a nice feature is that every time you lose a life the colours change.

The sound effects are adequate but are lifted above the average by the digitised speech: On loading you are greeted with the message, "The battle begins".

The credit for the quality of sound goes to 2-bit Systems' Replay add-on (which was reviewed in the June 1987 issue of *Atari User*).

More speech can be heard as you play, and it is always as crisp and clear as the opening message.

The game has a one-player mode and uses a joystick plugged into port one. It's response is very sharp, and this is necessary because at times you have to turn sharply to avoid the buildings or defence craft.

Beware of too much acceleration or you'll soon find yourself in deep trouble.

Mirax Force is well packaged and the inlay card carries some very nice artwork. The sound, graphics and superb scrolling complement each other superbly. My only reservation is that, at times, movement was so fast I had difficulty in telling what killed me.

Even though the gameplay is difficult it is addictive. Billed as the ultimate shoot-'em-up, with numerous levels featuring the very best of the Atari's graphic capabilities – I can only agree.

**Neil Fawcett**

| | |
|---|---|
| *Sound* | 9 |
| *Graphics* | 10 |
| *Playability* | 10 |
| *Value for money* | 9 |
| *Overall* | 9 |

# Blasting can be boring

*Program: Missing:...One Droid*
*Price: £2.99*
*Supplier: Bug-Byte, Victory House, Leicester Place, London WC2H 7NB.*
*Tel: 01-439 0666*

RUSTY is a rather young droid, whose manufacture date wasn't that long ago, and he is more than a bit impetuous. You see, Rusty likes to explore.

But one day, he got separated from his companions, so he went for a look around. When he stuck his hands into a topo-dimensional converter and promptly disappeared, the main computer wasn't all that surprised.

"Oh, well, another day, another droid," it muttered, and logged Rusty down in his memory banks as, "Faulty droid terminated". Well, it saved a lot of time, and was far easier than filing a report detailing Rusty's sudden disappearance.

But Rusty wasn't dead. In fact he was very much alive, but in a void, alone, except for surreal enemies whose only intent was his utter annihilation. His only chance was to run.

What little he knew about dimensional converters – which certainly wasn't much – told him that in a construct universe such as this, if he kept fighting and moving, it should stress the fabric of the universe.

In theory this should ensure that he would be thrown back into the real world. But how long will that take? Only you can decide...

That actual story covers up for what basically is a strange kind of shoot-'em-up. You control a small droid in the centre of the screen, and have to shoot anything that moves.

The enemies float around you in an attempt to collide with you, thereby draining your power.

To increase your life energy you have to make contact with the floating heart logos. These help, but not much and you have to collect a lot to make any gain at all.

The evil sprites you encounter come in various forms and colours – you need to destroy them all to progress to the next level. You may recognise a couple of the sprites too.

This is a weird kind of game, and it does get a little boring after a while. Though original, it soon becomes annoying rather than amusing.

Overall, there's not really much there. It's basic blast-everything-in-sight and this is made simple by holding down the fire button and waggling the joystick in slow circles.

The sound and gameplay are both very basic.

**Robert Swan**

| | |
|---|---|
| *Sound* | 6 |
| *Graphics* | 6 |
| *Playability* | 4 |
| *Value for Money* | 6 |
| *Overall* | 6 |

# Good, but not great

*Program: Four Great Games II*
*Price: £3.99 (cassette)*
*Supplier: Tynesoft, Addison Industrial Estate, Blaydon upon Tyne, Tyne and Wear NE21 4TE.*
*Telephone: 091-414 4611*

FOUR Great Games II is the latest budget compilation from Tynesoft. I wouldn't necessarily agree that the collection qualifies for the accolade Great.

The four included are a pretty mixed bunch – but there should be something on offer here to entertain or amuse a good many.

**Mousetrap** is a traditional platform game. You must guide Marvin the ravenous mouse through 22 screens to sniff out his favourite nibble, cheese.

Naturally, it isn't going to be made easy for you and all sorts of hazards and obstacles must be overcome including dragons, flying fried eggs, toilet rolls and Christmas puddings.

In each screen you must collect what appear to be flasks in order to gain access to the next one. The final one holds the giant wedge of golden cheese.

Mice and cheese are a slight departure from the more usual explorers and gems, but Mousetrap is hardly original.

Despite being described in the packaging blurb as incredible graphic animation, the graphics are only average and the sound – a continuous wailing discordant tune – is poor. It is nonetheless playable and pretty tricky too.

**Space Hawk** is a well put together vertically scrolling space shoot-'em-up. There's not much plot, just pure unadulterated mass murder.

Flying the gunship Zebra you have to earn your stripes by exploring the planets in the neighbouring Solar System.

The Star Council has given you licence to kill any hostile aliens, should you encounter them, and destroy their defences.

Naturally you come across millions of the little devils and of course they are all hostile – well I certainly never met a friendly one.

You have the ability to fly both up and down, and can also adjust your speed – which can make for some pretty tricky manoeuvring. Despite the ostensibly peaceful nature of your Solar System exploration, the actuality means that you must shoot anything that moves and just about anything that doesn't. Captain Kirk would not have approved I'm sure.

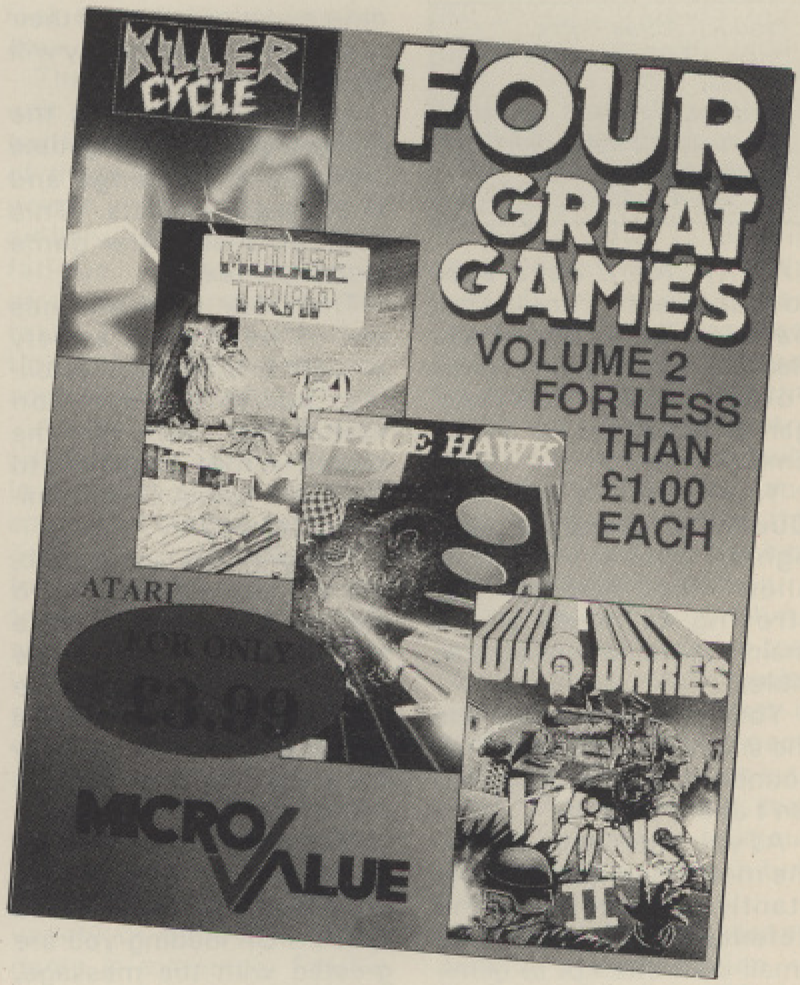
You start with a shield strength of 25 points which is gradually eroded by collisions with the kamikazi enemy space ships, each hit knocking off one point. To get to the next level the grounded space fleet must be destroyed, together with a substantial proportion of ground installations. The graphics are up to standard and the sound adequate, if not exactly stunning, making Space Hawk a good and pleasing game.

I played **Who Dares Wins II** last May and playing it again now, my opinion of it hasn't improved. Armed with a rifle and a dozen hand grenades you have to single-handedly defeat the enemy.

Working your way through a rather dismal landscape you must dodge lollipop trees, ponds and bullets on your way to the first enemy garrison.

If you beat off its defences you will gain access to the next level for a bit more of the same.

An extra life is awarded for each 10,000 points scored, but Who Dares didn't hold my interest long enough to get that far. The pace is rather too slow, graphics poor and sound irritating in the extreme.




**Killa Cycle** is altogether different: The visual presentation is simplistic to say the least and the plot absolutely minimal – just stay alive. It's for one or two players, with optional computer controlled opposition making the numbers up to four.

Pressing Start clears the screen and four coloured lines appear, each moving at a steady pace. The computer-controlled lines move by their own volition and you control the direction and speed of your own, leaving a solid coloured trail in your wake.

Neither you nor your opponents can move across any trail and the objective is to keep moving without crashing – hitting a trail means instant oblivion.

With four players this soon becomes pretty tricky and careful coordination is necessary to keep going in the tightest corners.

Players who crash disappear from the screen, together with their trail making more space available to the survivors. The last survivor is awarded maximum points and the others get points on a decreasing scale.

This game continues until a pre-set total is reached.

There are seven different screen layouts, rotated in turn with all but the first having blocks or small mazes to make life even more difficult.

Although it's a simple game in concept and presentation, I found it surprisingly enjoyable, competitive and addictive – although quite where cycles come into it I don't know.

At the price, Four Great Games II has to be good value for money.

**Niels Reynolds**

| | |
|---|---|
| *Sound* | *6* |
| *Graphics* | *7* |
| *Playability* | *7* |
| *Value for money* | *9* |
| *Overall* | *8* |

# Back to the future

## NEIL FAWCETT looks at software that has stood the test of time

**I BOUGHT my first cartridge game system a long time ago – an Atari VCS. At this time the company was relatively unknown in Britain, but the VCS was nonetheless a huge success. Soon after came the Atari home computers and this was when the games age really arrived.**

**Atari produced some superb software to complement its new computers. Vast numbers of games appeared in the form of rom cartridges and their popularity was second to none despite their cost, a hefty £30 or so. Then suddenly the cartridge-based games lost their appeal, mainly because of the advent of discs which were cheaper and easier to produce.**

**As the computers changed in quality and size of memory, so the software had to change too. Why settle for a good 16k cartridge game when you could write a superb 64k game disc and produce it more cheaply?**

**Atari's first major success was in the field of arcade games, which meant that many of the early cartridge-based packs were Atari Coin-op conversions.**

**The best of these have become legendary and entertained millions of Atari users world-wide. Not all the conversions met with acclaim, but the success stories far outnumber the failures.**

**Now, with the release of the new XE Games Console, Atari is attempting to bring the cartridges back into the limelight – at an attractive price.**

**This means that people new to the world of Atari will get a chance to play the classics that made these computers popular in the old days – and kept me up until late in the morning. So let's take a look at some of the old favourites that may again become blockbusters.**

### DEFENDER

Aliens have invaded your home planet and you have to fly around destroying them and rescuing the stranded humans before the aliens mutate them...

The object of the game is simple: Fly around in your super sleek space fighter blasting the aliens with your laser cannon or obliterating the entire screen with your smart bomb. The screen scrolls from left to right very smoothly. Most home micros offer versions of this game, but none is as spectacular as the Atari one.

Stunning graphics, fabulous sound effects and its awesome speed make this one a winner.

### GALAXIAN

The ultimate sequel to the early Space Invaders shoot-'em-up. Galaxian first appeared in arcades in 1979 and met with overwhelming success.

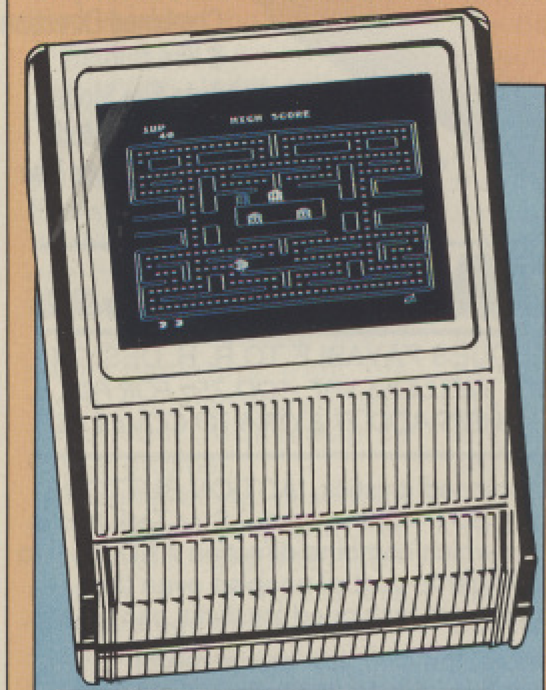
The Atari conversion retained all the characteristic qualities and charm of the original, and superb graphics and animation enhanced the playability.

Even after years of playing the game it's still a pleasure to watch wave after wave of alien nasties majestically gliding down the screen in an attempt to destroy you. Even if you don't rate shoot'-em-ups it's impossible not to like this one.

### CENTIPEDE

In 1981 Atari Coin-Op introduced this original game in arcades. It was later converted for the Atari 8 bit range and was very popular indeed.

You are in a garden with a bug sprayer, and you have to kill the centipedes as they come down the screen, but you are hindered by the

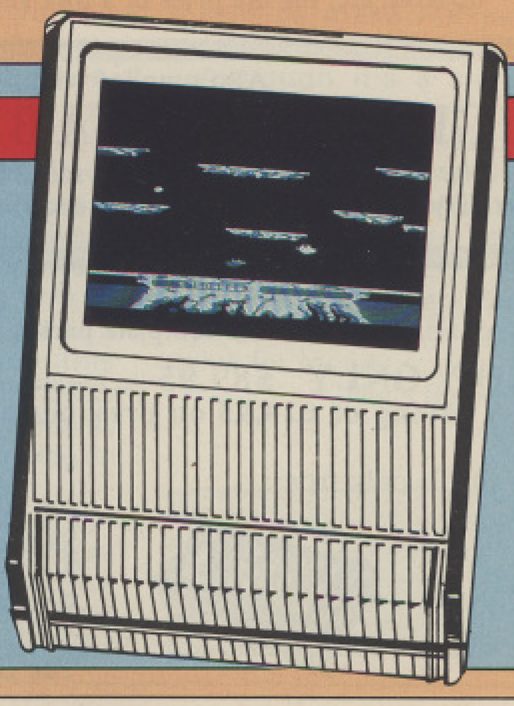


### PACMAN

If you haven't played Pacman you haven't lived – it's the ultimate in maze games and the inspiration of countless clones.

When released in the arcades it caused total paranoia as addicts flocked to play it. I had many a late night scurrying round the maze eating the pellets and attempting to avoid the hungry ghosts. But when I ate the power-pill it was my turn to do the eating!

### JOUST

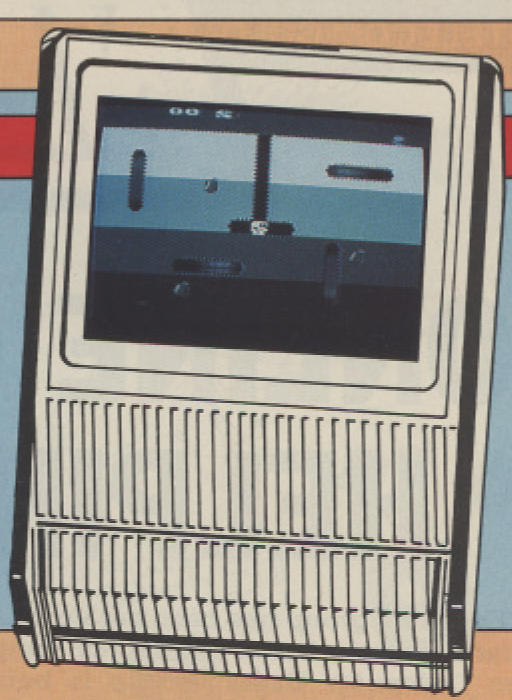


In this novel arcade conversion you are mounted on a giant bird. You have a jousting lance – hence the title – and you must do battle with other knights who are similarly mounted.

You are treated to stunning graphics and sound: The noise and animation of the birds are beautifully done and the playing field constantly changes.

Playing the computer is fun, but the game comes into its own when you have a live opponent.

## DIG-DUG



This is one of the most peculiar games I ever played on the Atari – not the most exciting, but certainly the most enjoyable. Originally written as an arcade *funny*, the conversion has kept all the humour.

The game play is simple – you have to earn points by tunnelling your way through the earth. Appearing on screen are bonus vegetables, and if you eat them before they disappear you can score up to 8,000 points. Living in small caves are monsters like Pooka the intelligent tomato that can kill you with a single touch.

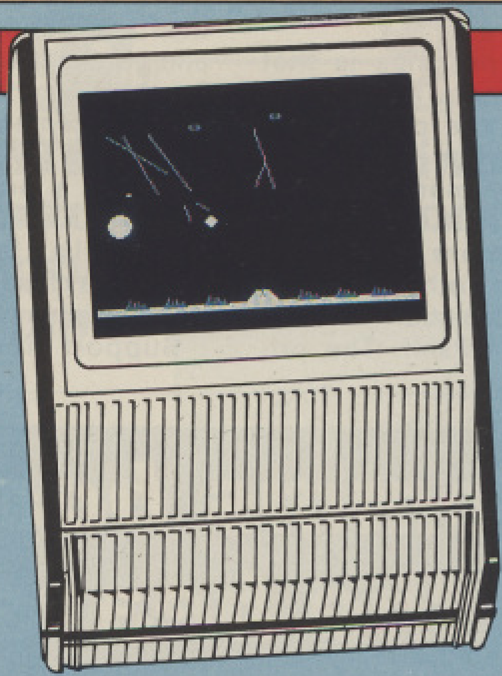
You can kill the monsters by dropping boulders on their heads or by pumping the fire button quickly to inflate them until they explode – a little bit gruesome perhaps – but different.

All in all this is a very amusing game and great for the kids.

fact that part of the time they are obscured by mushrooms. You can also move your bug spray up and down the screen as well as left to right – this was a new concept in shoot-'em-ups when the game was released.

This version hasn't quite got the style of the arcade original but it is certainly entertaining and challenging.

## MISSILE COMMAND



In this game – one of the most challenging I have ever played – you need lightning reactions as you attempt to save six cities from destruction by in-coming nuclear missiles.

As yet another arcade conversion this only differs from the original in that you control one missile base instead of three and use a joystick instead of a trak-ball. Later versions allow you to use Atari Trak-ball by pressing Control+T to put you into the right mode.

It's a game that every Atari owner should have and the new XE systems come with it built in.

## QIX

Here is one of the simplest games you could ever play and one of the most addictive. All you have to do is colour in 75 per cent of the screen – simple.

However, you are hindered as you do this by a Qix that bounces around the screen in a haphazard fashion, and by the two Sparx that travel along the lines you draw. If these or the Qix touch you you lose a life.

## STAR RAIDERS

When I first bought a 16k Atari 400 I got a joystick and this game. There has never been a challenge quite like it and never one that fits quite as snuggly into an 8k rom.

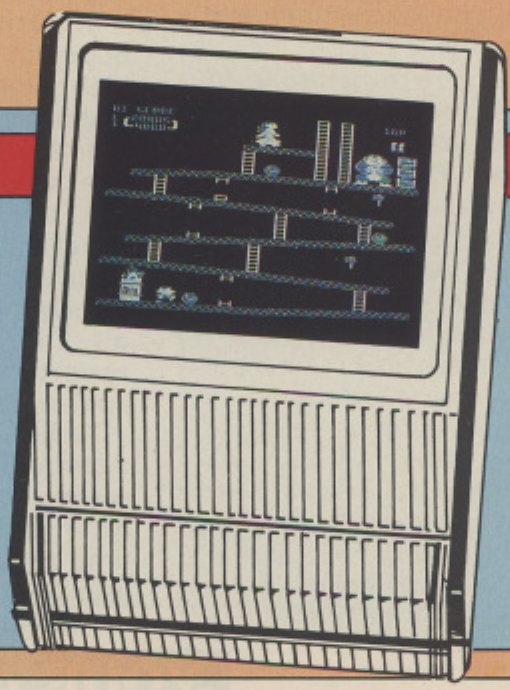
You take the role of a starship commander who has the simple task of saving the universe from total destruction – and all before breakfast.

The game is joystick controlled, but you also have a range of single-key commands.

Several years and numerous joysticks have not even dented my passion for this one. Many games have attempted to match it but none have succeeded.

It has been said that the early success of Atari computers can be attributed to this game – after all, a computer is only as good as the software written for it.

## DONKEY KONG



This is one of the first and, for me, one of the best platform games ever to be converted to a home micro.

You play the part of Mario, the maintenance man, and you have to rescue your girlfriend from the gigantic gorilla Donkey Kong. This is made difficult because he is constantly throwing barrels at you as you climb up each screen. You can jump over them or splat them using one of the sledgehammers positioned around the levels.

Due to the tremendous success of this game a follow-up – Donkey Kong Jr – was released and this also appeared on cartridge. In this version you play the son of Donkey Kong and you are out to rescue your dad who has been locked in a cage by Mario. The game play is similar and as much fun as the first. These are two very classy games.

MicroLink
in association with
TELECOM GOLD
NEWSLETTER

# ONLINE COMPUTERS ARE HELPING UK FARMERS

**A NEW users group has been set up on MicroLink to help UK farmers make better use of their computers. The British Farm Computer Users' Group is being organised by Andrew Cooley, who is project co-ordinator for on-farm systems with the Milk Marketing Board.**

"My experience is that many farmers are already exploring the potential of micros beyond their use in day-to-day management", he said, "but they suffer, perhaps more than managers in any other business, from the isolation inherent in farming itself. The primary aim of BFCUG is to overcome this isolation.

We want farm computer users to be able to share their ideas and experiences and get the maximum value from these immensely powerful management tools".

At first MicroLink is providing a farming section on its bulletin board, but eventually BFCUG will become a closed user group on the system.

Support for the new organisation has come from Dr John Craven, head of the Milk Marketing Board's farm management services, and from leading farm software suppliers Farmplan and Sum-It.

Special terms are being arranged for farmers subscribing to MicroLink and BFCUG – and a reduced subscription will also apply for existing MicroLink users who join BFCUG before the end of this year.

## Moving with the times

*ONE of Britain's largest removals specialists has joined MicroLink in order to improve communications between its widespread offices.*

*Scotpac – a subsidiary of P&O International Removals – ships by land, sea and air to just about anywhere in the world you can think of, everything from a single item to a houseful of furnishings.*

*The company has 15 depots in the British Isles plus branches in Australia, New Zealand, Canada, South Africa and the Middle East.*

*All are now able to send messages to each other via MicroLink telex and electronic mail services.*

*Scotpac has installed at least one micro and modem at each of its depots, and has eight micro systems in its Glasgow headquarters.*

*It all adds up to some very busy MicroLink mailboxes – last year Scotpac handled more than 20,000 individual shipments weighing a total of 21 million lbs.*

## Comms boom in the heavens

AMATEUR astronomers are joining MicroLink at the rate of ten a month.

The reason is that nothing beats electronic mail as a means of getting to know about the latest happenings in the heavens.

Initiative behind the booming interest in MicroLink comes from Guy Hurst, editor of The Astronomer, a monthly magazine with an international readership.

A constant stream of astral activity means he also needs to produce twice-weekly newsletters detailing all the fresh sightings reported by the Smithsonian Institute in America.

"When it is processed and distributed by conventional means, this information is often quite dated by the time it reaches our readers", said Guy Hurst.

"MicroLink has, however, speeded up the transmission of news from America. A paging device alerts me each time a telex message arrives from the Smithsonian and I don't waste a moment relaying it via Email.

"Those of our members with MicroLink facilities can often access information the same day it reaches me -- but others have to wait until one of my newsletters arrives by post. That's why so many astronomers are keen to join MicroLink.

"People in places as far away as Sweden, West Germany, Australia and New Zealand are now receiving the Email version of my newsletters. This means they are often able to study new phenomena within hours of a first sighting -- something not possible before we joined MicroLink".

## The fax in a flash

SHROPSHIRE entrepreneur Duncan Baker has come up with a novel idea for getting more mileage out of his MicroLink subscription.

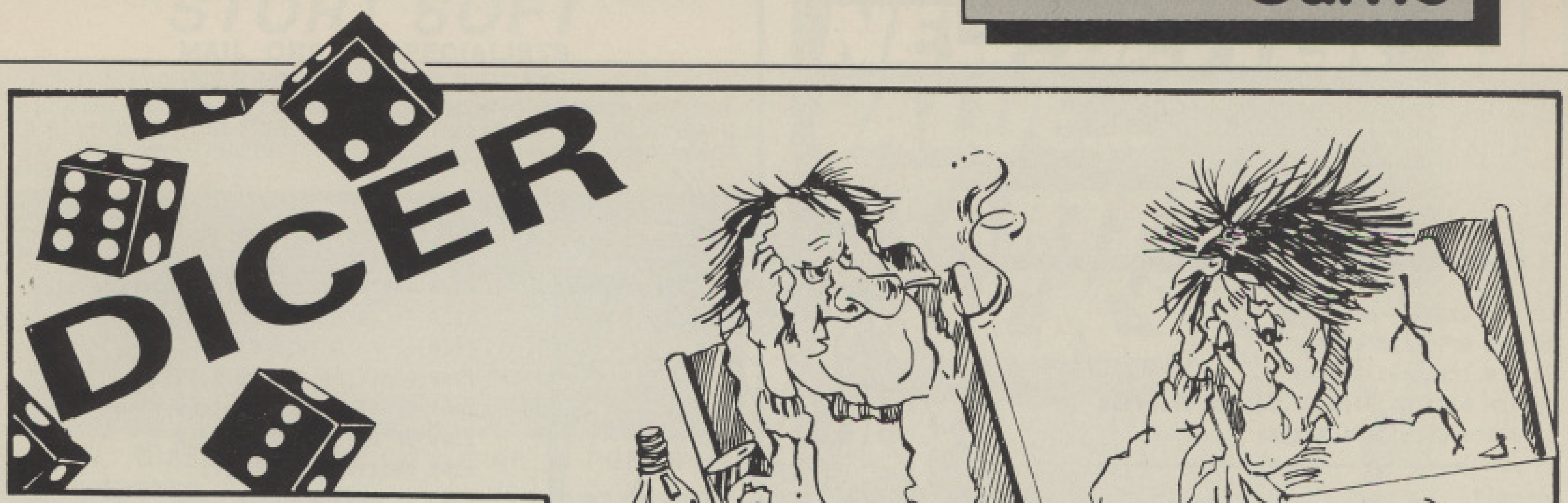
He is using the system to help him operate a faximile service from his office in Lydbury.

"Basically we need the fax machine for our own purposes", said Duncan, proprietor of the Lydbury English Centre, "but we have a fair amount of spare capacity.

"Seeking to help cover our costs we've started a fax service priced at roughly half that of other local agencies".

The service Duncan offers includes receiving text via MicroLink electronic mail or telex, printing it out on plain paper or letterhead and distributing it by fax. And of course this procedure also operates in reverse when required.

**YOUR chance to join MicroLink – Page 8**






**ANYONE who has played Yahtzee will know just how addictive it is. In this computerised version of the original dice game, points are gained by rolling five dice and holding those that seem the most useful.**

After a total of three full throws – irrespective of the number of dice held – you choose the category into which you want to enter the dice combination. The available categories are shown in Figure I and your final score is displayed once all these are all filled.

If the dice fall well after the first or second throw of a turn, just hold them all and select Throw again. After each set of three throws your score must be entered into a category – even if it means you get no points.

This program has been written with brevity in mind, and is fully controlled by the joystick using Fire to select or de-select dice held or to choose the category. Various prompts indicate what to do, and the program scores itself.

Even if you have never played the game before you will soon get the idea – and then have problems tearing yourself away from it. The challenge is simple: Score the maximum 346. With skill and luck it is possible.

## STEVE KNIGHT introduces an intriguing and sometimes infuriating game



### VARIABLES

| | |
|---|---|
| **DICE** | Holds the scores of the five dice used. The sixth position corresponds to the roll option |
| **CATS** | Corresponds to the screen position of the various categories |
| **OPTION** | Used initially to decide whether a dice has been held. Used again to chart the frequency of the occurrence of each number on the dice |
| **HISC** | High score |
| **SC** | Current score |
| **ROLLDICE**<br>**TOTUP** | Line numbers |

### PROGRAM BREAKDOWN

| | |
|---|---|
| **50-460** | Initialise variables and draw the screen |
| **500-700** | Main loop |
| **1000-1190** | Dice rolling and selection routine |
| **1200-1370** | Further routine to roll and display dice |
| **1400-1500** | Decide which character to print |
| **2000-2990** | Validate selected category and total score |

| Combination | Description | Score | Max |
|---|---|---|---|
| Ones | Any number of ones | Total of ones | 5 |
| Twos | Any number of twos | Total of twos | 10 |
| Threes | Any number of threes | Total of threes | 15 |
| Fours | Any number of fours | Total of fours | 20 |
| Fives | Any number of fives | Total of fives | 25 |
| Sixes | Any number of sixes | Total of sixes | 30 |
| High score | Any five dice | Total of all dice | 30 |
| Full house | Two dice the same, other three the same | 50 | 50 |
| Pair | Two dice the same | Highest pair | 12 |
| 3 of a kind | Three dice the same | Best three | 18 |
| 4 of a kind | Four dice the same | Best four | 24 |
| 5 of a kind | Five dice the same | Best five | 30 |
| 2 Pairs | Two dice the same and two others the same | Total of two pairs | 24 |
| Run of three | Three consecutive dice | Total of dice in run | 15 |
| Run of four | Four consecutive dice | Total of dice in run | 18 |
| Run of five | Five consecutive dice | Total of dice in run | 20 |
| | | **Total** | **346** |

*Figure I: Available categories*

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```
10 REM DICER
20 REM BY STEVE KIGHT
30 REM (c)ATARI USER
50 DIM DICE(6),PICK(5),CATS(2,8),L$(40
),OPTION(6),A$(40),B$(40)
60 L$="├────────────────┼────────────────
──────┤"
65 A$="┌────────────────┬────────────────
──────┐"
66 B$="└────────────────┴────────────────
──────┘"
70 HISC=0:ROLLDICE=1000:TOTUP=2000
80 DIM D1$(18),D2$(18),D3$(18)
100 D1$="   *  *  * ** ****"
110 D2$=" *     *     *    "
120 D3$="      *  ** ** ****"
200 GRAPHICS 16:SETCOLOR 4,6,2:SETCOLO
R 2,0,0
210 POKE 752,1:POKE 82,1
220 POSITION 1,0:? A$
230 ? "| ONES.........   | PAIR.......
..   |"
240 ? L$
250 ? "| TWOS.........   | 3 OF A KIND
..   |"
260 ? L$
270 ? "| THREES.......   | 4 OF A KIND
..   |"
280 ? L$
290 ? "| FOURS........   | 5 OF A KIND
..   |"
300 ? L$
310 ? "| FIVES........   | 2 PAIRS....
..   |"
320 ? L$
330 ? "| SIXES........   | RUN OF 3...
..   |"
340 ? L$
350 ? "| HIGH SCORE...   | RUN OF 4...
..   |"
360 ? L$
370 ? "| FULL H'SE....   | RUN OF 5...
..   |"
400 ? B$;
410 ? "  SCORE :          HIGH SCORE
:  ";
420 SC=0
430 POSITION 29,20:? "roll?"
440 POSITION 29,18:? "GO="
450 TOT=0
460 FOR N=1 TO 8:CATS(1,N)=0:CATS(2,N)
=0:NEXT N
500 FOR TURN=1 TO 16
510 POSITION 11,17:? TOT:POSITION 33,1
7:? HISC;
530 GOSUB ROLLDICE
560 GOSUB TOTUP
700 NEXT TURN
710 POSITION 10,22:? "PRESS RESET OR S
TART";
720 IF PEEK(53279)<>6 THEN 720
800 GOTO 200
1000 REM  ROLLDICE
1010 REM
1012 POSITION 10,22:? "   SELECT  DICE
        ";
1015 GO=1
1020 FOR N=1 TO 6:DICE(N)=0:OPTION(N)=
0:NEXT N
1025 GOSUB 1200
1030 CX=1:POSITION CX*5+1,21:? "X";
1100 FOR GO=2 TO 3
1110 IF CX=6 AND STRIG(0)=0 THEN GOSUB
 1200:GOTO 1180
1115 IF CX<6 AND STRIG(0)=0 THEN GOSUB
 1400
1116 IF STICK(0)<>7 AND STICK(0)<>11 T
HEN 1110
1117 OX=CX
1120 CX=CX+(STICK(0)=7)-(STICK(0)=11)
1130 IF CX<1 THEN CX=6
1140 IF CX>6 THEN CX=1
1145 POSITION OX*5+1,21
1147 IF OPTION(OX)=1 THEN ? "H"
1148 IF OPTION(OX)=0 THEN ? " "
1150 POSITION CX*5+1,21
1160 IF OPTION(CX)=0 THEN ? "X"
1170 IF OPTION(CX)=1 THEN ? "H"
1172 FOR D=1 TO 10:NEXT D
1175 GOTO 1110
1180 NEXT GO
1185 POSITION 5,21:? "
                ";:REM 31 SPACES
1190 RETURN
1200 REM ** ROLL 'EM **
1210 POSITION 32,18:? GO
1220 FOR A=1 TO 4
1230 FOR B=1 TO 5
1240 IF OPTION(B)=1 THEN 1350
1250 R=INT(RND(0)*6)+1
1280 DICE(B)=R
1290 POSITION B*5,18:? D1$(R*3-2,R*3)
1300 POSITION B*5,19:? D2$(R*3-2,R*3)
1310 POSITION B*5,20:? D3$(R*3-2,R*3)
1350 NEXT B
1360 NEXT A
1370 RETURN
1390 REM ** PICK DICE **
1400 IF OPTION(CX)=0 THEN OPTION(CX)=1
:POSITION CX*5+1,21:? "H":GOTO 1450
1410 IF OPTION(CX)=1 THEN OPTION(CX)=0
:POSITION CX*5+1,21:? "X"
1450 FOR D=1 TO 40:NEXT D
1500 RETURN
2000 REM  PICK AND TOTAL UP CATEGORY
2010 REM
2015 POSITION 10,22:? " SELECT CATEGOR
Y ";
```



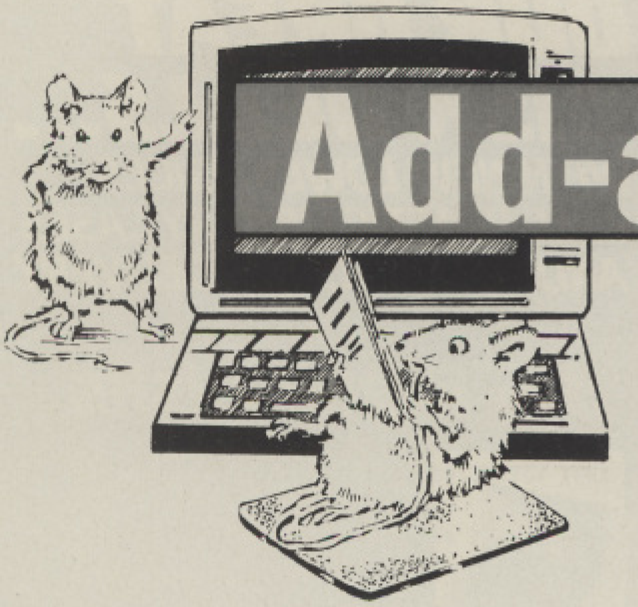
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Get it right!

| | | | | | |
|---|---|---|---|---|---|
| 10 CP1 (Y) | 340 D4U (7) | 1100 3UG (X) | 1290 6GA (U) | 2127 SXK (6) | 2550 WPM (P) |
| 20 CP2 (3) | 350 T3V (D) | 1110 CK7 (N) | 1300 62C (8) | 2130 HLL (4) | 2560 W3F (4) |
| 30 CP3 (X) | 360 DDU (7) | 1115 UWL (F) | 1310 5WD (U) | 2140 JA3 (F) | 2570 P3T (5) |
| 50 S9F (F) | 370 QYV (5) | 1116 R9C (5) | 1350 MYS (S) | 2160 L9D (C) | 2580 Q9W (X) |
| 60 1PK (W) | 400 CNG (9) | 1117 QL6 (A) | 1360 MYS (U) | 2170 LTA (A) | 2690 E8P (T) |
| 65 2JK (G) | 410 5OE (T) | 1120 9CT (O) | 1370 W4K (X) | 2180 C6T (W) | 2700 V94 (5) |
| 66 2S4 (E) | 420 DFH (4) | 1130 AKD (R) | 1390 DVN (U) | 2190 AYT (C) | 2710 WPM (A) |
| 70 6X2 (J) | 430 Q2X (J) | 1140 AV4 (S) | 1400 HY2 (R) | 2200 PD8 (P) | 2720 FTQ (K) |
| 80 A3P (3) | 440 HT2 (A) | 1145 DD6 (U) | 1410 W5E (X) | 2210 TOK (J) | 2730 GOU (F) |
| 100 WG7 (4) | 450 E36 (8) | 1147 PNP (R) | 1450 ALN (9) | 2220 A5L (2) | 2740 G6Y (G) |
| 110 UAY (4) | 460 PD3 (D) | 1148 PCP (S) | 1500 VXK (F) | 2230 PDW (S) | 2750 GE3 (A) |
| 120 XUC (C) | 500 8UR (T) | 1150 D7P (C) | 2000 CXP (C) | 2390 DVP (Y) | 2760 6TC (X) |
| 200 T8A (W) | 510 QCW (K) | 1160 PMX (H) | 2010 DOP (F) | 2400 DMO (2) | 2770 PD9 (E) |
| 210 A01 (C) | 530 35T (M) | 1170 QLX (G) | 2015 S1L (V) | 2405 SXK (1) | 2772 GKY (E) |
| 220 AVF (X) | 560 U2W (U) | 1172 AEK (Y) | 2020 D2P (S) | 2410 WAM (G) | 2775 7LH (T) |
| 230 P62 (5) | 700 YX7 (A) | 1175 PLD (Q) | 2030 VRO (K) | 2420 XPQ (W) | 2780 TN1 (8) |
| 240 D4T (F) | 710 AMT (P) | 1180 QPS (Y) | 2040 COA (A) | 2430 NQT (W) | 2785 7QH (W) |
| 250 R2S (K) | 720 QJR (2) | 1185 NRD (V) | 2050 6K6 (P) | 2440 WHM (K) | 2790 Q8T (C) |
| 260 DDT (R) | 800 Q1F (R) | 1190 WOK (U) | 2060 6LP (A) | 2450 GHR (U) | 2800 M4N (X) |
| 270 QM5 (F) | 1000 CXN (X) | 1200 D6N (V) | 2070 NGT (9) | 2460 NWT (T) | 2810 POM (L) |
| 280 DMT (3) | 1010 DON (R) | 1210 DY2 (V) | 2080 T6K (E) | 2470 6YT (S) | 2830 P7T (N) |
| 290 PUJ (F) | 1012 W18 (O) | 1220 UHJ (Q) | 2100 D2P (8) | 2490 EOP (V) | 2900 UO7 (G) |
| 300 CMU (6) | 1015 D9H (E) | 1230 UPK (V) | 2110 D4P (E) | 2500 J5Y (4) | 2910 U80 (9) |
| 310 RC9 (2) | 1020 WGU (8) | 1240 SXW (Q) | 2120 KH1 (1) | 2510 73U (5) | 2920 147 (L) |
| 320 CVU (C) | 1025 SKO (H) | 1250 98P (G) | 2123 35U (A) | 2520 EKO (R) | 2930 4EN (5) |
| 330 NW5 (E) | 1030 11V (Q) | 1280 RTO (9) | 2125 X3G (1) | 2540 LO5 (S) | 2990 XOL (5) |

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```
2020 REM ** POSITION CURSOR **
2030 X=0:Y=0
2040 FOR N=8 TO 1 STEP -1
2050 IF CATS(2,N)<>99 THEN X=2:Y=N
2060 IF CATS(1,N)<>99 THEN X=1:Y=N
2070 NEXT N
2080 POSITION X*18-2,Y*2-1:? "X";
2100 REM ** MOVE ON JOYSTICK **
2110 REM
2120 IF STRIG(0)=0 THEN GOSUB 2400:RET
URN
2123 MOVE=STICK(0)
2125 IF MOVE<>7 AND MOVE<>11 AND MOVE<
>13 AND MOVE<>14 THEN 2120
2127 POSITION X*18-2,Y*2-1:? " ";
2130 X=X+(MOVE=7)-(MOVE=11)
2140 Y=Y+(MOVE=13)-(MOVE=14)
2160 IF Y<1 THEN Y=8:X=X-1
2170 IF Y>8 THEN Y=1:X=X+1
2180 IF X>2 THEN X=1
2190 IF X<1 THEN X=2
2200 IF CATS(X,Y)=99 THEN 2130
2210 POSITION X*18-2,Y*2-1:? "X";
2220 FOR D=1 TO 10:NEXT D
2230 GOTO 2120
2390 REM ** CALCULATE SCORES **
2400 SC=0
2405 POSITION X*18,Y*2-1:? " "
2410 FOR N=1 TO 6
2420 OPTION(N)=0
2430 NEXT N
2440 FOR N=1 TO 6
2450 OPTION(DICE(N))=OPTION(DICE(N))+1
2460 NEXT N
2470 IF X=2 THEN 2700
2490 REM ** COLUMN 1 **
2500 IF Y<7 THEN SC=OPTION(Y)*Y:GOTO 2
900
2510 IF Y=8 THEN 2540
2520 FOR N=1 TO 6:SC=SC+OPTION(N)*N:NE
XT N:GOTO 2900
2540 SC=50
2550 FOR N=1 TO 6
2560 IF OPTION(N)=1 OR OPTION(N)=4 THE
N SC=0
2570 NEXT N
2580 GOTO 2900
2690 REM ** COLUMN 2 **
2700 X=2:DB=0
2710 FOR N=1 TO 6
2720 IF Y=1 AND OPTION(N)>1 THEN SC=N*
2
2730 IF Y=2 AND OPTION(N)>2 THEN SC=N*
3
2740 IF Y=3 AND OPTION(N)>3 THEN SC=N*
4
2750 IF Y=4 AND OPTION(N)>4 THEN SC=N*
5
2760 IF Y=5 AND DB>0 AND OPTION(N)>1 T
HEN SC=SC+(N*2)+DB
2770 IF Y=5 AND DB=0 AND OPTION(N)>1 T
HEN DB=N*2
2772 IF Y=5 AND OPTION(N)>3 THEN SC=N*
4
2775 IF N<3 THEN 2830
2780 IF Y=6 AND OPTION(N)>0 AND OPTION
(N-1)>0 AND OPTION(N-2)>0 THEN SC=(N*3
)-3
2785 IF N<4 THEN 2830
2790 IF Y=7 AND OPTION(N)>0 AND OPTION
(N-1)>0 AND OPTION(N-2)>0 AND OPTION(N
-3)>0 THEN SC=(N*4)-6
2800 IF Y<8 OR N<4 THEN 2830
2810 IF OPTION(N)>0 AND OPTION(N-1)>0
AND OPTION(N-2)>0 AND OPTION(N-3)>0 AN
D OPTION(N-4)>0 THEN SC=(N*5)-10
2830 NEXT N
2900 POSITION X*18-2,Y*2-1:? SC
2910 CATS(X,Y)=99
2920 TOT=TOT+SC
2930 IF TOT>HISC THEN HISC=TOT
2990 RETURN
```



# Add-a-Mouse

**SIMON MILLER has a handy line in joystick-driven cursor routines**

**MOST programs require input from you at some stage, even if it's only to select a game level, or supply a yes/no answer. Complex software often has a wide range of options to choose from, and in these circumstances a mouse-controlled menu offers significant advantages over standard keyboard input.**

The mouse moves a cursor around the screen, without affecting anything that's already printed there – usually a menu of available options. You position the cursor over the option you want, then press a button to select it – there's no keyboard entry whatsoever, so you can't accidentally type something which will crash the program.

A mouse can be used where keyboard input is difficult – for example on graphics screens without text windows – so many people will find it much less daunting than an array of keys.

The ST series all contain an operating system which is specifically designed for mouse control. No such luck with the 8 bit range, unfortunately, but it is possible to emulate many mouse features using an ordinary joystick. Atari's artist program Paint employs this technique to select colours and textures.

The routine described here will move a player-missile cursor, under joystick control, quickly and smoothly around the screen in any Graphics mode, even while a Basic program is running. The cursor's horizontal and vertical coordinates are returned in two addresses at the top of page 6, so there's no problem keeping track of position, and you can define a window anywhere on screen to confine it.

The cursor can flash at a rate of your choice, or remain unblinking, and it's easy to switch the entire mouse system on or off at different points in your Basic program.

You could also use this routine to make letter-matching, word-finding, counting or other educational games for small children who cannot yet read or write.

It's also valuable for applications involving the general public, such as fund-raising events or shop demonstrations, where the computer console can be locked well away from marauding fingers.

Program I contains the main routine. It's mainly machine code, so take great care typing the data statements, and be sure to save a copy before you run it for the first time.

Line 10 reserves eight pages above screen memory to hold all the data. The first four act as a buffer to protect the machine code from those commands which erase data above RAMTOP. Clear screen and Graphics commands will erase the first 64 bytes in the reserved area, while scrolling a text window will erase a total of 800 bytes. If there is no risk from these commands in your Basic program you can change the second statement in line 10 to POKE 106,S and this saves you 1k of memory.

The next four pages hold the player-missile table but, as always, the first 384 bytes are not used for player or missile data, so we can store all the machine code there.

The routine wedges itself into the vertical blank interval and is therefore executed automatically every fiftieth of a second. This means that the routine does not steal any of Basic's processing time, so program speed is not affected and the program will run happily no matter what Basic is doing.

```
1 REM MOUSE DRIVER ROUTINE
2 REM BY SIMON MILLER
3 REM (c)ATARI USER
10 S=PEEK(106)-4:POKE 106,S-4:GRAPHICS
 0:S2=S*256
20 FOR X=0 TO 348:READ D:POKE S2+X,D:N
EXT X
30 DATA 104,104,104,141,7,212,141,245,
6,24,105,2,133,204,133,206,169,0,133,2
03
40 DATA 133,205,141,246,6,141,252,6,16
8,162,2,145,203,136,208,251,230,204,20
2,208
50 DATA 246,104,104,141,254,6,104,104,
141,255,6,169,3,141,29,208,169,46,141,
47
60 DATA 2,169,107,141,249,6,169,17,141
,250,6,169,203,141,247,6,169,49,141,24
8
70 DATA 6,169,14,141,192,2,169,2,141,2
53,6,160,102,174,245,6,169,7,32,92
80 DATA 228,96,173,254,6,208,6,141,0,2
08,76,98,228,173,252,6,208,7,169,1
90 DATA 141,245,6,208,23,205,246,6,176
,15,169,0,141,246,6,173,245,6,73,1
100 DATA 141,245,6,16,3,238,246,6,173,
120,2,201,15,240,121,173,255,6,24,105
110 DATA 5,168,162,5,169,0,145,205,136
,202,16,250,173,120,2,41,1,208,20,173
120 DATA 255,6,56,237,253,6,205,250,6,
176,3,173,250,6,141,255,6,208,25,173
130 DATA 120,2,41,2,208,18,173,255,6,2
4,109,253,6,205,249,6,144,3,173,249
140 DATA 6,141,255,6,173,120,2,41,4,20
8,20,173,254,6,56,237,253,6,205,248
150 DATA 6,176,3,173,248,6,141,254,6,2
08,25,173,120,2,41,8,208,18,173,254
160 DATA 6,24,109,253,6,205,247,6,144,
3,173,247,6,141,254,6,172,255,6,169
170 DATA 32,145,205,200,145,205,200,16
9,248,145,205,200,169,32,145,205,200,1
45,205,173
180 DATA 245,6,208,5,141,0,208,240,6,1
73,254,6,141,0,208,162,15,189,0,208
190 DATA 208,10,202,16,248,169,0,141,2
51,6,240,11,138,10,10,10,10,29,0,208
200 DATA 141,251,6,141,30,208,76,98,22
8
210 X=USR(S2,S,125,61)
```

**Get it right!**

| | | |
|---|---|---|
| 1 CAJ (W) | 60 S47 (O) | 140 F1A (D) |
| 2 CAK (3) | 70 FP3 (P) | 150 HO1 (6) |
| 3 CAL (V) | 80 HDF (1) | 160 FAV (T) |
| 10 VPE (E) | 90 E57 (C) | 170 8SC (V) |
| 20 QTO (P) | 100 Q7H (R) | 180 HFA (7) |
| 30 S74 (E) | 110 PVA (8) | 190 NU4 (4) |
| 40 QT9 (K) | 120 LR4 (F) | 200 X2H (V) |
| 50 U2T (L) | 130 E46 (4) | 210 64T (O) |

Listing I: Main mouse program

Line 210 starts everything off. The first number in brackets is the address of our machine code. The second is the address – high byte only – of the player-missile table, and the final two parameters specify where the cursor will initially appear on screen, horizontal followed by the vertical position. The values shown will place it centrally.

You will normally want to tailor the mouse parameters for your specific application, so 11 addresses at the top of page 6 are used as registers, and you can change the values in nine of these to suit yourself.

Table I shows the function of each address. 1781 and 1782 are used, along with page zero addresses 205 and 206, as counters and pointers.

| | |
|---|---|
| 1781 | Counter (do not alter) |
| 1782 | Counter (do not alter) |
| 1783 | Cursor window right border |
| 1784 | Cursor window left border |
| 1785 | Cursor window bottom border |
| 1786 | Cursor window top border |
| 1787 | Colour overlap detector |
| 1788 | Flash rate |
| 1789 | Cursor speed |
| 1790 | Current horizontal position |
| 1791 | Current vertical position |

*Table I: The page 6 registers*

Don't alter any of these, or the program will crash.

The default values in 1783 to 1786 allow the cursor to move anywhere on-screen, but you can use these registers to define a restricted window. For example, POKE 1783,91 will stop the cursor descending into the text window at the bottom of a graphics screen.

Address 1787 lets you use colour, rather than cursor position, to detect which menu item has been chosen. When the cursor overlaps one of the four possible playfield colours – either a text mode letter or a map mode pixel – the number shown in Table II is returned.

This value is updated only once during each vertical blank period, though the cursor may move several times. You might therefore get an apparently false reading when the cursor is close to, but not actually touching, a playfield colour. To minimise this problem, keep the speed value below 4, and use the centre of the cross, not its arms, to indicate your target.

| Number in 1787 | Colour | Register | Default colour |
|---|---|---|---|
| 65 | COLOR0 | (708) | Orange |
| 66 | COLOR1 | (709) | Yellow |
| 68 | COLOR2 | (710) | Blue |
| 72 | COLOR3 | (711) | Pink |
| 0 | COLOR4 | (712) | Black |

*Table II: Cursor/Playfield overlap*

Address 1788 controls the cursor flashing routine. Its default value is 0, which keeps the cursor unblinking, but any other number will start it flashing at the rate specified by that number. Values between 2 and 8 should prove suitable. The flash rate is also affected by cursor speed – address 1789 – so you will usually need to set these two parameters together.

Address 1789 controls the speed of the cursor movement, and it is initially set to 2. It governs the number of times the cursor moves during each vertical blanking interval, and you can modify it to suit your requirements. If you set it to zero, the cursor won't move at all, while a setting of 4 will move it four steps every VB period, which is pretty fast.

Unfortunately, since the joystick register is updated only once per VB period, the four steps will all be in the same direction. This means in effect that higher speeds give you less resolution, and make it more difficult to position the cursor very precisely.

1790 and 1791 hold the cursor's current horizontal and vertical position respectively. You will normally use these two registers to detect which menu item has been chosen.

The values refer to positions on the player-missile grid, and do not correspond to row or column numbers in any Graphics mode. Your Basic program can translate them easily enough into row and column coordinates, if necessary.

1790 is also used as a switch. Poke it with 0 to turn the mouse routine off and remove the cursor from the screen. To switch it back on, do another USR call like the one in line 210, with different values for horizontal and vertical position if you wish.

The additional lines of Basic in Program II show a simple application – using the mouse system to select a colour for the text window. Plug a joystick into port 1 and use it to position the cross anywhere along the menu line you want, then press the trigger. Lines 410 onwards check the cursor's vertical position, to see which item has been chosen, then set the selected colour.

Exactly the same principle can be used for more complex menus and, since you can use any Graphics mode, the choices may be indicated by pictures, or icons, rather than words.

Although the program is primarily intended to drive a mouse, the fast, smoothly moving cross would make an ideal gunsight in arcade-type games, and address 1787 makes it easy to see whether you're on target. Remember that all the initialisation for two-line resolution PM graphics has been done for you, and players 1 to 3 are available.

Listing II: Additional program to add menu options to Lising I

```
220 REM Add this code to Program 1 to
set up a demonstration menu.
230 GRAPHICS 2:POKE 559,46:REM must re
-set DMACTL after every GRAPHICS comma
nd.
240 REM Set up window for cursor movem
ent:
250 POKE 1783,147:REM right-hand borde
r.
260 POKE 1784,105:REM Left-hand border
.
270 POKE 1785,82:REM Bottom border.
280 POKE 1786,18:REM Top border.
290 POKE 1788,4:REM Cursor flash rate
300 POKE 1789,1:REM reduce cursor spee
d.
310 POSITION 7,0:? #6;"BLACK"
320 POSITION 7,1:? #6;"YELLOW"
330 POSITION 7,2:? #6;"GREEN"
340 POSITION 7,3:? #6;"ORANGE"
350 POSITION 7,4:? #6;"BROWN"
360 POSITION 7,5:? #6;"BLUE"
370 POSITION 7,6:? #6;"PINK"
380 POSITION 7,7:? #6;"GREY"
390 POSITION 7,8:? #6;"WHITE"
400 IF STRIG(0)=1 THEN 400
410 VP=PEEK(1791):REM Cursor's current
 vertical position.
420 IF VP<21 AND VP>15 THEN SETCOLOR 2
,0,0:GOTO 510
430 IF VP<29 AND VP>22 THEN SETCOLOR 2
,12,10:GOTO 510
440 IF VP<37 AND VP>32 THEN SETCOLOR 2
,12,4:GOTO 510
450 IF VP<45 AND VP>38 THEN SETCOLOR 2
,2,8:GOTO 510
460 IF VP<53 AND VP>46 THEN SETCOLOR 2
,15,6:GOTO 510
470 IF VP<61 AND VP>54 THEN SETCOLOR 2
,9,8:GOTO 510
480 IF VP<69 AND VP>62 THEN SETCOLOR 2
,4,8:GOTO 510
490 IF VP<77 AND VP>70 THEN SETCOLOR 2
,0,4:GOTO 510
500 IF VP<85 AND VP>78 THEN SETCOLOR 2
,0,12:GOTO 510
510 REM Any additional Basic code can
go here.
520 GOTO 400
```

Get it right!

| | | |
|---|---|---|
| 220 D3T (D) | 330 U43 (K) | 440 8SG (Y) |
| 230 V6W (7) | 340 UWN (W) | 450 986 (L) |
| 240 DCT (8) | 350 WQW (1) | 460 972 (V) |
| 250 8AL (A) | 360 UKS (6) | 470 9HM (7) |
| 260 8FS (L) | 370 U7M (8) | 480 9VA (O) |
| 270 8NF (D) | 380 U3E (Q) | 490 9H2 (8) |
| 280 8SF (M) | 390 W25 (7) | 500 94R (K) |
| 290 31P (F) | 400 JWN (2) | 510 CYW (R) |
| 300 1WU (N) | 410 C84 (1) | 520 QJC (E) |
| 310 T4G (Y) | 420 7KA (7) | |
| 320 WFR (A) | 430 6AM (7) | |




# Getting inside the console

## ANDRE WILLEY takes an in-depth look at the Atari XE systems

**FOLLOWING last month's overview of the new Atari XE games console and keyboard, let's take a more detailed look at how it performs and what you can expect if you decide to buy one.**

As you probably know by now the XE system is supplied in two versions. The first is the straightforward games console with joystick and built-in Missile Command. In this configuration you could, in fact, add both a tape deck and a disc drive, but you'd only be able to use them to load pre-recorded games.

That said, the difference in cost between cassette and cartridge based software would quickly offset the price of an XC12 tape deck.

The second package comes with joystick, light gun, plug-in keyboard and the Bug Hunt cartridge game making a 64k 8 bit computer which, in practical terms, is almost identical to the old 800XL. In addition, you also get the cartridge version of Flight Simulator II – a very well respected aircraft emulator game which uses both joystick and keyboard.

Those interested in the games angle might like to note that Missile Command will run very effectively with a Track-Ball.

What you don't get, however, is a tape deck, which I find a little surprising as this pack is being sold as a programmer-oriented item. But you do now have the basis of a complete computer system and you can add most of the peripherals available for the 8 bit range – but more of that later.

Let's start by looking at the console from the outside. Most of the standard I/O connections are present, including the now obligatory two, rather than four, joystick sockets, the 13-pin serial I/O port and the 7-pin Din power socket which, incidentally, uses the same power supply module as the rest of the XL and XE range.

Also present are the TV output – phono socket with detachable RF cable – and two new sockets, composite video and audio out. These always used to be part of a 5-pin Din socket which also included chromiance and luminance (colour and brightness) signals but neither are all that likely to be missed.

## Convenient

The cartridge socket is on the top of the machine as with the XL series, and is much more convenient than the awkward rear-mounted system used on the 130XE. It should take all XL/XE cartridges, including the sophisticated bank selecting ones such as Action!, Mac/65 and Basic/XE.

The final socket, which has never been featured on an Atari 8 bit machine before, is a 15-way D socket to allow connection of the removable keyboard.

Unfortunately for any serious computer users Atari has not allowed any expansion of the machine by rather short-sightedly omitting the parallel bus which has been present on all Atari 8 bit for the last six years. This means you can't add any of the now very common memory boards, fast I/O modifications or even such mainstream computer products as hard discs.

I find this to be an unacceptable cost-cutting exercise. After all, how much would it have cost to leave a simple edge connector – or even the edge of the PCB itself – protruding from the rear of the casing? In order to save a few pence Atari has eliminated the possibility of using the XE console as a serious computer system.

Other than this one little niggle I found the new unit, with it's elegant detachable keyboard, to be a marked improvement over the older machines. Certainly the quality of both the television and composite video outputs show a marked improvement over the rather faint and slightly blurred 130XE display.

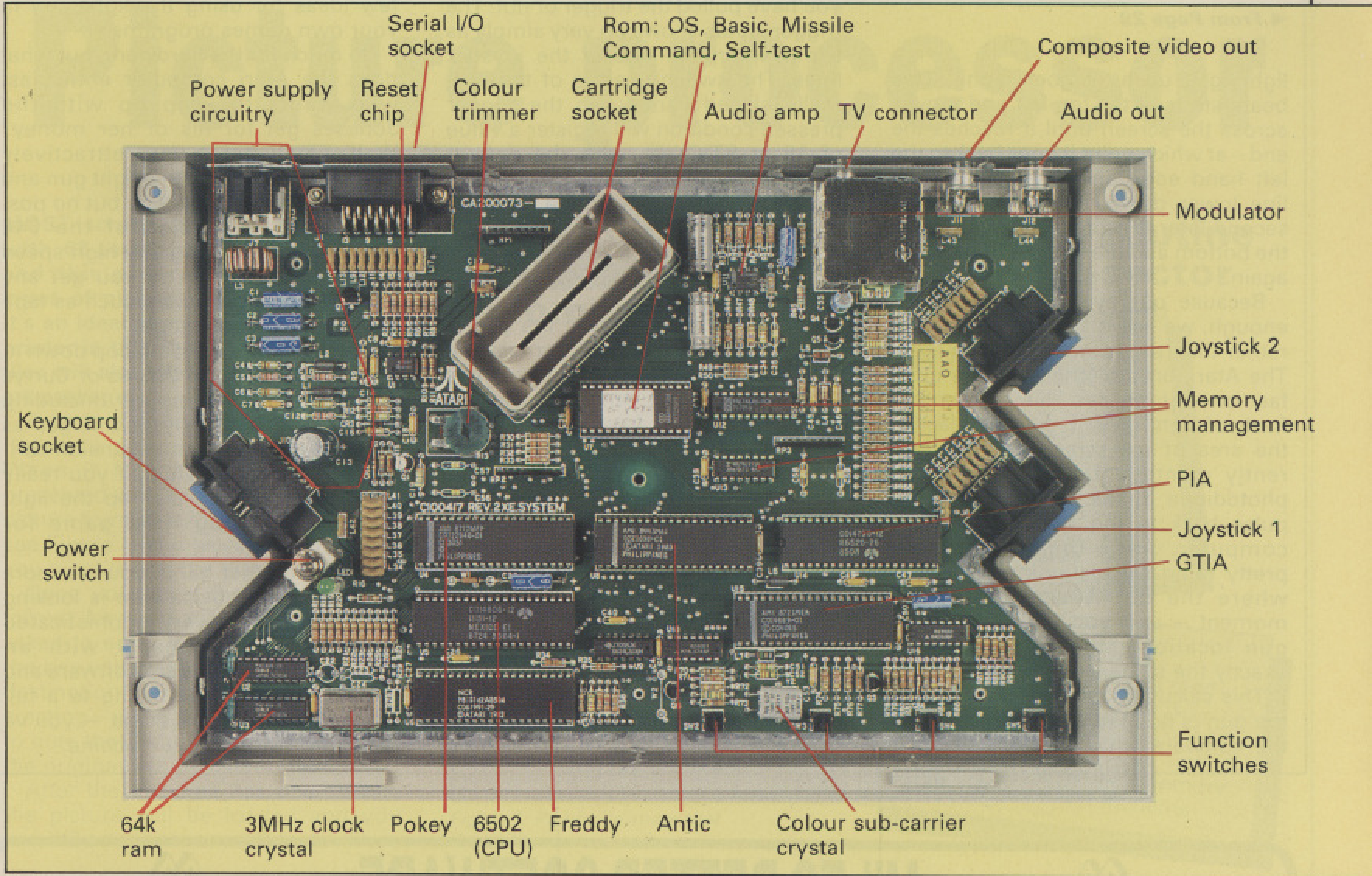
The sculptured keyboard has an excellent feel with a light but very positive action. The layout is the same as that of the 130XE, with the exception of the function keys which are now round, pastel-shaded buttons along the top of the unit. It would, however, have been nice if Atari had marked the keys with both the control key graphics and the international character set rather than just the graphic set.

Now let's see what's new under the bonnet – surprisingly little in fact. In essence the only difference you're likely to notice at first is the fact that Missile Command is now built into the machine. This, together with Basic, the operating system and the self-test routines are all packed into a single 32k rom chip banked into the correct locations by the Freddy chip and a couple of memory management support chips.

The power-up sequence now checks for the presence of the keyboard before deciding what portions of the rom to enable. If there is no keyboard

**Current Atari Computer/Console Packages**

| Model | Includes | Price |
|---|---|---|
| XES 3001 | *Console and joystick only* | £79.99 |
| XES 4001 | *Console, keyboard, joystick, Flight Simulator II cartridge, Light gun and Bug Hunt cartridge* | £119.99 |
| XES 2002 | *Keyboard, XC12 data recorder, 10 games on two tapes* | £59.99 |
| XES 2001 | *Light gun and Bug Hunt cartridge* | £29.99 |
| 130XE Pack | *130XE 128k computer, XC12 data recorder, joystick and 10 games on two tapes* | £139.99 |
| 65XE Pack | *65XE 64k computer, XC12 data recorder, joystick and 10 games on two tapes* * (Dixons/Currys special offer) | £99.99* |




*XE games console internal layout*

the default is to run Missile Command. Hold down Option and you'll get the self-test mode, Select gives you Basic (for all the good it will do you without a keyboard) and Start gives a cassette boot.

## The operating system

If the OS detects the presence of a keyboard the default power-up is Basic and Option gives you self-test mode. Select gives Missile Command, Start requests a tape load and, as with previous Atari machines, the buttons may be used in combination – such as Start and Option to override Basic when you load a machine code game.

The first thing I did when I received my console was to check which revision of the operating system was being used. Dated May 7, 1987 it has the same internal code as the 130XE (BB/001), but is entitled Revision 4.0 – I don't know what happened to Revision 3. The differences between Revision 4.0 and the XL/XE OS are purely cosmetic – most of them being in the self-test routine.

The latter's initialise locations at $5003 and $5000 have been moved to $5000 and $5006 respectively, and the keyboard template has been altered to show the correct XE layout, rather than that of the old 1200XL. This probably explains the major modifications to the OS which exist at $CA54 to $CB55. However, the Break key still doesn't show up correctly on the test.

The power-up and system reset routines have some extra code patched in at $CB65 to take note of the possible new configurations – such as booting with Missile Command. I'm not sure why Atari bothered, since the modified handler doesn't seem to be able to cope correctly with the game in any case.

For example, if you boot the system with Missile Command and then press Reset you will be dropped back into self-test, and the next time you try you'll be returned to either Missile Command or Basic depending upon whether you have a keyboard attached. Fortunately, when you're working in Basic the Reset handler seems pretty reliable.

The only thing worth mentioning is the patch at $CB90 which enables the cassette handler to look for the Start key as well as Return to start cassette I/O. This was added at the last moment after a frantic plea from Atari UK saying that users without the keyboard add-on wouldn't be able to boot commercial games tapes.

Strangely enough, most of the parallel device driver code designed to interface with the XL/XE parallel bus is still present. All that seems to have been altered are some vectors at $E49E – in other words, there's a large chunk of totally wasted rom inside the XE console – besides the self-test, that is.

## The light gun

The only new item in the package is the light gun and this comes with its own Bug Hunt game cartridge – the only game currently available. The firing range will depend on your TV set, but I managed to get a comfortable 10 feet away from my 27in screen with no problems.

If we're to believe Atari's adverts, it would appear that the gun fires an invisible beam of light at the television screen. This is not strictly true – what actually happens is that the TV set fires a completely visible beam of light at the gun.

As you will know if you've followed some of the more technical articles in *Atari User*, a TV set works by scanning a pinpoint of light across the screen,

**Turn to Page 30 ▶**

◀ *From Page 29*

lighting it up as it goes along. This beam starts at the top left and moves across the screen until it reaches the end – at which point it goes back to the left hand edge and starts again one line lower down. Some fiftieth of a second later this process has reached the bottom and the whole things starts again.

Because our eyes don't react fast enough, we see it as one solid image rather than a fast moving dot of light. The Atari, on the other hand, is quite fast enough to see the momentary flash of light. When the dot reaches the area of the screen you are currently pointing the gun at a small photodiode in the gun registers the pulse back to the Antic chip in the computer. Antic then does some pretty rapid calculations to work out where the dot is at that precise moment – and you have your light gun location. Light pens work in exactly the same way.

This calculation happens whenever the gun is pointed at the TV set – it is the software which decides whether you have pulled the trigger or not. The trigger status shows up very simply as a movement on one of the joystick lines. The switch used is of the normally closed variety, so the trigger pressed condition will register a value of 15 at STICK(0), with the default result being 14 – exactly the opposite to what you'd except from a joystick.

## PEEKing

The horizontal position of the gun is always available by PEEKing location 564 ($234), and the vertical position is at 565 ($235). The vertical location is easiest to use – it registers 6 at the top of the screen and 123 at the bottom.

Horizontally, the gun will register between 85 and 95 at the left of the screen. This value will then increase to about 227 two-thirds of the way across at which point it will drop back to zero and start counting up again to between 20 and 30.

It's always best to work out the correct values for your own television – but you must remember to use a formula to calculate the true horizontal value. Next month I'll show you a few ideas for using the light gun in your own games programs.

So much for the hardware, but what does the Atari computer enthusiast who wants to keep up with the Joneses get for his or her money? Well, you'll get a very attractively designed package with a light gun and Missile Command built in, but no possibility for expansion of the 64k memory, or of adding any high-speed peripherals. Neither do you get any form of storage medium such as tape or disc with the package.

Alternatively you could pop down to your local branch of Dixons or Currys and buy a 65XE computer (including an XC12 tape deck, joystick, 10 games and that all important expansion connector) for £99.99. Then, if you really want one, you can pick up the light gun and the Bug Hunt game for £29.99.

If, on the other hand, you are more of a computer novice who is looking for a cheap but very sophisticated games playing console with an amazing range of superb software and the possibility of upgrading to a full computer at a later stage – you've definitely got the right machine.

# Picture processor

**GRANVILLE DANBY provides a routine to convert picture files into 62-sector uncompressed form**

**MOST screen dump utilities work with 62-sector uncompressed files, and this program converts other types of picture files into this form. It's an ideal companion to the poster printer in this issue. Once converted, files will also load into the AtariArtist art package.**

Type in the program and use Get it Right! to correct any typing errors. When it is first run you will be presented with a menu of the different picture formats the program can use – see Figure I. You select option four if you want to see the disc directory.

Once you have chosen a suitable format for your picture, you will be asked to enter the source filename – the one you want to convert – and the destination filename – the one you're creating – of the picture. It is important to note that if they are both the same, the original will be overwritten.

After the filename has been given, the picture will be loaded and you press S to save it as a 62-sector file.

**PROGRAM BREAKDOWN**

| | |
|---|---|
| **10-110** | Print text |
| **120-210** | Get source picture format |
| **220-280** | Get source and destination filenames |
| **290-460** | Read in and display the picture |
| **470-510** | Save the picture out as a 62-sector file |
| **520-600** | Disc directory routine |
| **610-650** | Loop to wait for a key input |
| **660** | Machine code data for the save routine |

**VARIABLE**

| | |
|---|---|
| **DUM** | Dummy bytes to read in before picture is loaded |
| **FN$** | Source filename |
| **SCR** | Start of screen memory |
| **FN2$** | Destination filename |

**Graphic Art Department**

**Paint**

**Graphic 7 screen**

*Figure I: Picture formats that the utility can convert*

```
10 REM ***********************
20 REM * PICTURE CONVERTER  *
30 REM * BY GRANVILLE DANBY *
40 REM * (c) ATARI USER     *
50 REM ***********************
60 DIM FN$(20),DA$(20),FN2$(20)
70 FOR X=1536 TO 1567:READ Y:POKE X,Y:
NEXT X
80 GRAPHICS 0:SETCOLOR 4,9,2:SETCOLOR
2,0,0:POKE 752,1
90 POKE 82,0
100 POSITION 11,3:? "PICTURE CONVERTER
"
110 POSITION 11,4:? "-----------------
"
130 ? :? " 1. GRAPHICS ART DEPARTMENT.
"
140 ? " 2. PAINT."
150 ? " 3. GRAPHICS 7 SCREEN."
155 ? " 4. DISC DIRECTORY."
160 TRAP 530:? :?
170 ? " SELECT THE ART PACKAGE THAT TH
E"
175 ? " PICTURE HAS BEEN CREATED WITH.
":? :? :POSITION 1,16:INPUT A
180 IF A<1 OR A>4 THEN 80
190 IF A=1 THEN DUM=5
200 IF A=2 THEN DUM=16
210 IF A=3 THEN DUM=0
215 IF A=4 THEN GOTO 530
220 ? :? "PLEASE ENTER FILENAME OF SOU
RCE PICTURE e.g. D:SPACE.PIC"
230 TRAP 80
240 INPUT FN$
250 ? :? "PLEASE ENTER FILENAME OF DES
T. PICTURE  e.g. D:SPACE.MIC"
260 INPUT FN2$
270 GRAPHICS 31
280 POKE 708,10:POKE 709,6:POKE 710,0:
POKE 712,15
290 REM *** READ IN PICTURE ***
300 OPEN #1,4,0,FN$
310 IF DUM=0 THEN 330
320 FOR T=1 TO DUM:GET #1,A:NEXT T
330 SCR=PEEK(88)+256*PEEK(89)
340 TRAP 420
350 FOR X=0 TO 191 STEP 2
360 FOR Y=0 TO 39
370 GET #1,BYTE
380 POKE SCR+Y+(X*40),BYTE
390 POKE SCR+Y+(X*40)+40,BYTE
400 NEXT Y
410 NEXT X
420 SOUND 1,50,10,10
430 FOR T=1 TO 400:NEXT T
440 SOUND 1,0,0,0
450 GOSUB 620
460 IF K<>83 THEN 450
470 REM *** SAVE OUT PICTURE ***
480 OPEN #1,8,0,FN2$
490 Q=USR(1536)
500 CLOSE #1
510 RUN
520 REM *** DISK DIRECTORY ***
530 ? CHR$(125):OPEN #1,6,0,"D:*.*"
540 TRAP 560
550 INPUT #1,DA$:? DA$,:GOTO 550
560 ? :? :? :? "         PRESS  SPACE
TO CONTINUE"
570 CLOSE #1
580 GOSUB 620
590 IF K<>32 THEN 580
600 RUN
610 REM *** GET A KEY ***
620 CLOSE #1:OPEN #1,4,0,"K:"
630 GET #1,K
640 CLOSE #1
650 RETURN
660 DATA 169,11,162,16,157,66,3,165,88
,157,68,3,165,89,157,69,3,169,0,157,72
,3,169,30,157,73,3,32,86,228,104,96
```

**Get it right!**

| | | |
|---|---|---|
| 10 CP1 (Y) | 220 79S (G) | 450 PMM (S) |
| 20 CP2 (3) | 230 PT6 (F) | 460 4XX (R) |
| 30 CP3 (X) | 240 R7H (W) | 470 DQV (H) |
| 40 CP4 (4) | 250 DJ9 (O) | 480 5QK (4) |
| 50 CP5 (Y) | 260 RYH (K) | 490 RKV (1) |
| 60 CAY (N) | 270 X4T (S) | 500 LXD (K) |
| 70 JVP (Q) | 280 NKN (E) | 510 DGN (1) |
| 80 8M4 (R) | 290 DYT (4) | 520 D3W (A) |
| 90 Q8E (D) | 300 2NJ (K) | 530 TQP (9) |
| 100 JPX (9) | 310 6A8 (S) | 540 RF9 (E) |
| 110 1W9 (M) | 320 41L (1) | 550 PRH (Q) |
| 130 C38 (K) | 330 ND3 (6) | 560 TAT (X) |
| 140 VM1 (V) | 340 R27 (5) | 570 MTD (F) |
| 150 SO1 (5) | 350 7NR (Y) | 580 QON (V) |
| 155 L1X (8) | 360 TT3 (7) | 590 54Y (R) |
| 160 X6H (9) | 370 T82 (K) | 600 DCP (8) |
| 170 FMW (C) | 380 MAC (2) | 610 CYX (1) |
| 175 8JJ (Y) | 390 W51 (K) | 620 AMS (C) |
| 180 723 (R) | 400 QG4 (W) | 630 QQ1 (T) |
| 190 D64 (O) | 410 QG4 (K) | 640 MFE (8) |
| 200 CJN (G) | 420 OS2 (O) | 650 RTA (5) |
| 210 CCN (1) | 430 8SD (U) | 660 J3G (F) |
| 215 DHD (G) | 440 PUR (D) | |


SINK THAT SUB!
ATARI



# By NICK PEARCE

**BATTLE stations!...Battle stations! Enemy submarine detected on sonar, all hands on deck...!**

You are on a mission in hostile waters in command of one of Her Majesty's finest battleships – the Royal Oak. The enemy submarines are a constant threat and as you go about your task, you never have a moment's rest.

Your ship is armed with the latest depth-charges, which you can use to destroy either enemy submarines or their projectiles – the choice is yours.

At the beginning of the game you choose one of four missions: Novice, Commander, Captain or Admiral – the hardest. Points are scored for destroying enemy vessels and a bonus number of depth-charges is also given.

The subs lurk at four different depths, and the points and bonus charges obtained for destroying one depends how deep it is. They use shoals of fish to hide behind, and if one of your depth-charges hits one it will explode and the enemy will escape.

Each mission lasts five minutes and if you survive you are awarded bonus points depending upon the number of depth-charges you've got left. If at any time you are hit by an enemy missile your depth-charge count is reduced by 25 and if it drops below 25 your ship will begin to glow until the count reaches zero when it will explode and your mission ends.

You control the ship using a joystick in port one and a depth-charge is released by pressing fire.

The game features the smooth movement of up to 20 objects and over sixteen colours on screen at one time. This is accomplished by the clever use of player-missile graphics, Vertical Blank Interrupts and Display List Interrupts.

**SCORE TABLE**

| Sub depth | Extra bombs | Points |
|---|---|---|
| 1 | 2 | 63 |
| 2 | 4 | 127 |
| 3 | 6 | 191 |
| 4 | 8 | 255 |

```
1 REM SUBMARINE HUNTER
2 REM BY N.PEARCE
3 REM (c)ATARI USER
5 GOTO 7ØØØ
49 REM DISPLAY
5Ø N$=STR$(PEEK(PTSH)*256+PEEK(PTSL)):
M$="ØØØØØ":M$(6-LEN(N$))=N$:POSITION 3
,Ø:? M$
7Ø N$=STR$(PEEK(BOMS)):M$="ØØØ":M$(4-L
EN(N$))=N$:POSITION 11,Ø:? M$:RETURN
99 REM MAIN LOOP
1ØØ COUNT=FREQ
11Ø CLOCK=CLOCK+1:GOSUB SHOW:IF PEEK(C
ONSOL)<>7 THEN 4ØØ
12Ø IF CLOCK/PIP=INT(CLOCK/PIP) THEN G
OTO INT(CLOCK/PIP)*1Ø+8ØØ
14Ø IF PEEK(HIT) THEN 3ØØ
19Ø COUNT=COUNT-1:IF COUNT THEN 11Ø
199 REM SUBS FIRE MISSILE
2ØØ FOR DEPTH=D TO 8 STEP 2:M=PEEK(XPO
S+DEPTH)
21Ø IF M<6Ø OR M>185 OR NOT PEEK(XSPD
+DEPTH) THEN 28Ø
22Ø FOR I=Ø TO 7:IF PEEK(MS+I) THEN NE
XT I:GOTO 28Ø
23Ø POP :SOUND 3,1,2,5
24Ø POKE MX+I,PEEK(XPOS+DEPTH)+(PEEK(S
HAP+DEPTH)=2Ø8)*15
25Ø POKE MY+I,PEEK(YPOS+DEPTH):POKE MS
+I,S(DEPTH):SOUND 3,Ø,Ø,Ø
28Ø GOSUB SHOW:NEXT DEPTH:GOTO 1ØØ
299 REM SHIP HIT
3ØØ SOUND 3,2Ø,Ø,15:M=PEEK(COL+4):N=PE
EK(BACK):GOSUB SHOW
32Ø FOR I=Ø TO 5:POKE COL+4,RND(Ø)*255
33Ø IF  NOT PEEK(BOMS) THEN POKE TIME,
55
34Ø POKE BACK,RND(Ø)*255:NEXT I:GOSUB
SHOW
36Ø POKE COL+4,M:POKE BACK,N:SOUND 3,Ø
,Ø,Ø
38Ø IF PEEK(BOMS) THEN POKE HIT,Ø:GOTO
 19Ø
39Ø FOR I=Ø TO 2ØØ:NEXT I
399 REM GAME OVER
4ØØ POKE HIT,1:POKE SHAP,Ø:GOSUB BUZZ:
J=PEEK(PTSH)*256+PEEK(PTSL)+EXTRA
41Ø I=INT(J/256):POKE PTSL,J-256*I:POK
E PTSH,I:GOSUB SHOW
42Ø IF J>HI THEN HI=J:GOSUB SHOWHI
43Ø IF  NOT EXTRA THEN Z=199:GOSUB PEN
:? "GAME  OVER":FOR I=Ø TO 9ØØ:NEXT I:
GOTO 5ØØ
44Ø Z=17Ø:GOSUB PEN:? "MISSION ACCOMPL
ISHED"
45Ø Z=219:GOSUB PEN:? EXTRA;"  BONUS P
OINTS"
46Ø FOR I=Ø TO 36:SOUND 3,45,1Ø,4:FOR
J=Ø TO 45:NEXT J
47Ø SOUND 3,5Ø,1Ø,4:FOR J=Ø TO 35:NEXT
 J:NEXT I:SOUND 3,Ø,Ø,Ø
499 REM DISPLAY OPTIONS
5ØØ GOSUB ERASE:GOSUB SHOW:GOSUB SHOWH
I
51Ø POKE SHAPAGE,MYTOP+17
53Ø Z=52:GOSUB PEN:? "submarine hunter
"

54Ø Z=124:GOSUB PEN:? "RESET to finish
"

55Ø Z=196:GOSUB PEN:? "SELECT":GOSUB L
EVEL
56Ø Z=412:GOSUB PEN:? "START for game"
599 REM READ CONSOLE KEYS
6ØØ K=PEEK(CONSOL):IF K=7 THEN 6ØØ
62Ø POKE 77,Ø:GOSUB BUZZ:IF K<>SELECT
THEN 68Ø
65Ø DIFF=DIFF+1:IF DIFF=4 THEN DIFF=Ø
66Ø GOSUB LEVEL
68Ø IF K<>START THEN 6ØØ
699 REM BEGIN THE GAME
7ØØ GOSUB ERASE:POKE SHAPAGE,MYTOP
71Ø POKE SHAP,56:POKE XPOS,124:POKE HI
T,Ø
72Ø POKE PTSL,Ø:POKE PTSH,Ø:FREQ=999:E
XTRA=Ø
74Ø GOSUB SHOW:GOSUB SHOWHI:GOTO 1ØØ
799 REM DIFFICULTY LEVEL
81Ø D=6:FOR I=2 TO 8 STEP 2:S(I)=3:NEX
T I:FREQ=1Ø:GOTO 1ØØ
82Ø D=4:GOTO 11Ø
83Ø FREQ=9:GOTO 11Ø
84Ø FREQ=8:GOTO 11Ø
85Ø FREQ=7:GOTO 11Ø
86Ø D=2:GOTO 11Ø
87Ø S(8)=4:GOTO 11Ø
88Ø S(6)=4:GOTO 11Ø
89Ø S(4)=4:GOTO 11Ø
9ØØ FREQ=6:GOTO 11Ø
91Ø GOTO 11Ø
92Ø FREQ=5:GOTO 11Ø
93Ø GOTO 11Ø
94Ø FREQ=4:GOTO 11Ø
95Ø GOTO 11Ø
96Ø FREQ=3:GOTO 11Ø
97Ø GOTO 11Ø
98Ø IF  NOT DIFF THEN 111Ø
99Ø FREQ=2:GOTO 11Ø
1ØØØ GOTO 11Ø
1Ø1Ø FREQ=1:GOTO 11Ø
1Ø2Ø IF DIFF=1 THEN 111Ø
1Ø3Ø S(8)=5:GOTO 11Ø
1Ø4Ø GOTO 11Ø
1Ø5Ø GOTO 11Ø
1Ø6Ø IF DIFF=2 THEN 111Ø
1Ø7Ø S(2)=4:GOTO 11Ø
1Ø8Ø GOTO 11Ø
1Ø9Ø S(6)=5:GOTO 11Ø
11ØØ S(4)=5:GOTO 11Ø
111Ø EXTRA=PEEK(BOMS)*15*(DIFF+1):GOTO
 4ØØ
1999 REM SHOW HIGH SCORE
2ØØØ N$=STR$(HI):M$="ØØØØØ":M$(6-LEN(N
$))=N$:POSITION 17,Ø:? M$:RETURN
2499 REM ERASE
25ØØ FOR Z=44 TO 424 STEP 2Ø:GOSUB PEN
:? B$:NEXT Z
2899 REM ORIG
29ØØ Z=552
2999 REM PEN
3ØØØ I=SCR+Z:J=INT(I/256):POKE 88,I-25
6*J:POKE 89,J:POSITION Ø,Ø:RETURN
4199 REM LEVEL OF GAME
42ØØ Z=2Ø4:GOSUB PEN:IF DIFF THEN ? "n
ovice":GOTO 422Ø
421Ø ? "NOVICE":POKE BOMS,12Ø:PIP=8Ø:C
LOCK=Ø:POKE BEAT,1
422Ø Z=251:GOSUB PEN:IF DIFF<>1 THEN ?
 "commander":GOTO 424Ø
423Ø ? "COMMANDER":POKE BOMS,1ØØ:PIP=5
3:CLOCK=1Ø:POKE BEAT,3
```

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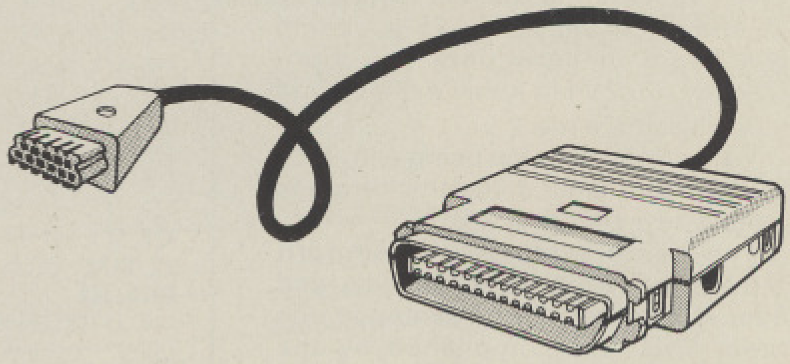
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```
4240 Z=300:GOSUB PEN:IF DIFF<>2 THEN ?
 "captain":GOTO 4260
4250 ? "CAPTAIN":POKE BOMS,80:PIP=36:C
LOCK=20:POKE BEAT,7
4260 Z=348:GOSUB PEN:IF DIFF<>3 THEN ?
 "admiral":GOTO 4280
4270 ? "ADMIRAL":POKE BOMS,60:PIP=26:C
LOCK=25:POKE BEAT,15
4280 GOSUB ORIG:GOTO SHOW
4999 REM BUZZ
5000 SOUND 3,100,10,8:FOR T=0 TO 9:NEX
T T:SOUND 3,0,0,0:RETURN
6999 REM SETUP ROUTINE
7000 MYTOP=PEEK(106)-24:POKE 106,MYTOP
7010 SDMCTL=559:PCOLR=704:COL=708:SIZE
P=53256:SIZEM=53260
7020 GRACTL=53277:CONSOL=53279:AUDCTL=
53768:SKCTL=53775:PMBAS=54279
7030 SHAPAGE=206:MLOW=207:MHIGH=208:PC
=1559
7040 PX=1562:MX=1565:PY=1573:MY=1576:P
S=1584:MS=1587
7050 COLR=1600:XPOS=1610:YPOS=1620:SHA
P=1630:XSPD=1640
7060 BACK=1650:TIME=1670:HIT=1661:XX=1
690:YY=1695
7070 BOMS=1669:BEAT=1737:PTSL=1738:PTS
H=1739:SELECT=5:START=6
7090 SHOW=50:SHOWHI=2000:ERASE=2500:OR
IG=2900:PEN=3000:LEVEL=4200:BUZZ=5000
7300 DIM M$(5),N$(5),S(8),B$(40):B$(1)
=" ":B$(20)=" ":B$(2)=B$
7399 REM COUNTDOWN TIMER
7400 DIM TM$(68):FOR I=1 TO 68:READ J:
TM$(I)=CHR$(J):NEXT I:K=ADR(TM$)
7410 TIMER=K+43:I=INT(K/256):TM$(61,61
)=CHR$(I):TM$(63,63)=CHR$(K-I*256)
7440 DATA 198,203,208,36,165,204,133,2
03,160,32,177,88,201,144,240,7,170
7450 DATA 202,138,145,88,48,17,136,177
,88,201,144,240,10,170,202,138,145
7460 DATA 88,200,169,153,145,88,76,98,
228,104,104,104,133,204,133,203,160
7470 DATA 32,169,153,145,88,136,145,88
,162,6,160,0,169,7,76,92,228
7499 REM INSTRUCTIONS
7500 GRAPHICS 0:POKE 82,1:POKE 752,1
7520 SETCOLOR 1,0,10:SETCOLOR 2,9,2:SE
TCOLOR 4,9,2
7540 ? :? " SUBMARINE HUNTER by N.Pear
ce,(c)1988 ":?
7600 ? "Enemy subs protected by shoals
 of fish"
7610 ? "pass underwater  at 4 differen
t depths"
7620 ? "firing missiles to the surface
 "
7630 ? "You command a warship armed wi
th bombs"
7640 ? "(used for both attack and defe
nce). 25"
7650 ? "bombs are lost every time your
 ship is"
7660 ? "hit & you are destroyed if you
 run out"
7670 ? "of bombs."
7680 ? "There are 4 missions:Novice,Co
mmander,"
7690 ? "Captain & Admiral (hardest). B
ombs are"
7700 ? "deducted and  points  gained a
t a rate"
7710 ? "depending  on the mission.  Ga
in extra"
7720 ? "bombs and points by destroying
 subs:-"
7730 ? "    DEPTH 1 = BOMBS 2 + POINTS
 63"
7740 ? "          2 =       4
 127"
7750 ? "          3 =       6
 191"
7760 ? "  deepest 4 =       8
 255"
7770 ? "A mission lasts  5 minutes  an
d if you"
7780 ? "survive you get bonus points!"
7790 ? "Use  Joystick  1 to move your
ship and"
7800 ? "press the trigger to release b
ombs.";
7900 GOSUB BUZZ:POSITION 24,0:? " WAIT
     ";:X=USR(TIMER,32)
7999 REM MACHINE CODE ROUTINE
8000 DIM FILL$(17),COPY$(23),VBION$(10
),VBIOFF$(10),DLION$(45)
8020 FOR I=1 TO 17:READ J:FILL$(I)=CHR
$(J):NEXT I
8030 DATA 104,104,104,133,208,160,0,13
2,207,104,104,145,207,200,208,251,96
8040 FOR I=1 TO 23:READ J:COPY$(I)=CHR
$(J):NEXT I
8050 DATA 104,104,104,133,206,104,104,
133,208,160,0,132,205,132,207,177,205,
145,207,200,208,249,96
8060 FOR I=1 TO 10:READ J:VBION$(I)=CH
R$(J):NEXT I:VBION$(3,3)=CHR$(MYTOP+4)
8070 DATA 104,162,0,160,0,169,7,76,92,
228
8080 FOR I=1 TO 10:READ J:VBIOFF$(I)=C
HR$(J):NEXT I
8090 DATA 104,162,228,160,98,169,7,76,
```



```
92,228
8100 FOR I=1 TO 45:READ J:DLION$(I)=CH
R$(J):NEXT I
8110 DATA 104,173,11,212,201,122,208,2
49,169,0,141,47,2,141,124,6
8120 DATA 169,164,141,48,2,169,204,141
,0,2,169,6,141,49,2,141
8130 DATA 1,2,169,63,141,47,2,169,192,
141,14,212,96
8299 REM PAGE 6
8300 X=USR(ADR(FILL$),6,0)
8320 FOR I=1536 TO 1543:READ J:POKE I,
J:NEXT I
8330 DATA 3,12,48,192,252,243,207,63
8340 FOR I=0 TO 3:POKE 1544+I,MYTOP+20
+I:NEXT I
8360 FOR I=0 TO 4:READ J,K:POKE XX+I,J
:POKE YY+I,K:NEXT I
8370 DATA 14,7,13,2,10,254,7,252,2,255
8399 REM DISPLAY LIST
8400 FOR I=1700 TO 1731:READ J:POKE I,
J:NEXT I
8410 POKE 1705,MYTOP+12:SCR=(MYTOP+12)
*256
8420 DATA 112,240,112,198,0,0,6,6,6,6,
6,134,6,134,6,134,6,134,6,134,6,134,6,
134,6,6,134,6,6,6,65,164,6
8499 REM DLI
8500 FOR I=1740 TO 1788:READ J:POKE I,
J:NEXT I
8510 DATA 72,138,72,152,72,174,124,6,1
88,74,6,189,114,6,69,79,37,78,141,10,2
12
8520 DATA 141,26,208,140,3,208,189,64,
6,141,21,208
8530 DATA 232,224,10,208,2,162,0,142,1
24,6,104,168,104,170,104,64
8540 FOR I=0 TO 9:READ J,K:POKE YPOS+I
,J:POKE BACK+I,K:NEXT I
8550 DATA 32,58,76,116,90,114,108,114,
124,114,140,114,156,112,172,112,188,11
2,208,20
8599 REM TOP OF MEMORY
8600 FOR I=12 TO 23:X=USR(ADR(FILL$),M
YTOP+I,0):NEXT I
8699 REM CHARACTER SET
8700 FOR I=0 TO 1:X=USR(ADR(COPY$),224
+I,MYTOP+I):NEXT I
8710 K=MYTOP*256
8720 FOR I=K+8 TO K+127:READ J:POKE I,
J:NEXT I
8730 FOR I=K+208 TO K+223:READ J:POKE
I,J:NEXT I
8800 DATA 0,0,0,0,0,8,64,2,0,0,0,8,6
5,20,2
8810 DATA 32,0,18,72,33,20,2,72,0,8,82
,1,108,150,9,80
8820 DATA 136,82,59,46,220,59,74,17,13
6,219,127,62,255,254,91,17
8830 DATA 20,54,28,60,255,255,126,60,0
,0,40,56,16,0,0,0
8840 DATA 0,32,132,0,16,66,8,0,0,128,2
24,248,252,252,254,255
8850 DATA 0,1,3,31,63,127,255,255,0,0,
131,207,255,255,255,255
8860 DATA 62,255,255,255,255,255,255,2
55,0,0,225,241,251,255,255,255
8870 DATA 6,143,223,255,255,255,255,25
5,8,24,24,24,255,125,255,126
8880 DATA 16,24,24,24,255,190,255,126
8899 REM VBI
8900 K=K+1024
8920 FOR I=K TO K+1100:READ J:POKE I,J
:NEXT I
8950 X=USR(ADR(VBIOFF$))
8999 REM START
9000 POKE COL,26:POKE COL+1,166:POKE C
OL+2,20:POKE COL+3,122:POKE COL+4,56
9010 POKE PMBAS,MYTOP+16:POKE SIZEP+3,
1:POKE SIZEM,0:POKE 623,17
9020 POKE MLOW,0:POKE MHIGH,MYTOP+19:P
OKE SDMCTL,0:POKE GRACTL,3
9030 POKE 756,MYTOP:POKE SHAPAGE,MYTOP
+17:POKE AUDCTL,0:POKE SKCTL,3
9050 FOR I=SCR TO SCR+4:POKE I,INT(RND
(0)*4)+76:NEXT I:POKE SCR+5,74
9060 FOR I=SCR+20 TO SCR+23:POKE I,INT
(RND(0)*4)+76:NEXT I:POKE SCR+19,75
9070 FOR I=SCR+504 TO SCR+527:POKE I,I
NT(RND(0)*4)+140:NEXT I
9080 Z=532:GOSUB PEN:? "PNTS  BOMBS  H
IGH";
9090 X=USR(ADR(VBION$)):X=USR(ADR(DLIO
N$)):GOTO 500
9199 REM VBI DATA
9200 DATA 216,173,84,6,24,105,8,133,20
4,162,3,188,8,208,152,41
9210 DATA 4,208,10,152,41,2,208,5,152,
41,1,240,54,74,168,185
9220 DATA 59,6,208,47,185,37,6,197,204
,144,40,169,27,153,59,6
9230 DATA 152,10,168,169,8,153,0,210,1
53,1,210,165,20,41,1,208
9240 DATA 10,169,0,157,44,6,157,55,6,2
40,8,169,0,157,40,6
9250 DATA 157,51,6,202,16,181,173,74,6
,24,105,3,133,209,105,9
9260 DATA 133,203,162,7,189,40,6,205,8
4,6,144,39,197,204,176,43
9270 DATA 189,29,6,197,209,144,36,197,
203,176,32,173,125,6,208,19
9280 DATA 238,125,6,173,133,6,56,233,2
5,141,133,6,176,5,169,0
```

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```
9290 DATA 141,133,6,169,0,157,40,6,157
,51,6,202,16,198,162,8
9300 DATA 189,94,6,240,11,189,74,6,201
,14,144,4,201,238,144,56
9310 DATA 173,10,210,41,15,133,209,173
,10,210,16,7,24,41,1,105
9320 DATA 1,208,2,9,254,157,104,6,48,6
,160,14,169,208,208,4
9330 DATA 160,222,169,216,157,94,6,152
,24,101,209,157,74,6,173,10
9340 DATA 210,41,240,105,8,157,144,6,2
02,208,2,208,179,189,94,6
9350 DATA 240,11,189,74,6,201,18,144,4
,201,234,144,61,173,10,210
9360 DATA 41,15,133,209,173,10,210,41,
7,201,7,240,8,201,3,208
9370 DATA 6,169,0,208,2,169,6,24,105,2
53,157,104,6,48,4,169
9380 DATA 18,208,2,169,218,24,101,209,
157,74,6,169,72,157,94,6
9390 DATA 173,10,210,41,240,105,6,157,
144,6,202,208,174,173,133,6
9400 DATA 201,26,176,9,238,144,6,238,1
44,6,24,144,5,169,48,141
9410 DATA 144,6,169,0,141,104,6,173,13
3,6,208,5,169,1,141,125
9420 DATA 6,173,125,6,240,9,173,10,210
,141,144,6,24,144,79,165
9430 DATA 20,45,201,6,240,11,238,202,6
,208,6,238,203,6,206,133
9440 DATA 6,172,120,2,192,15,240,44,16
9,0,133,77,152,41,8,208
9450 DATA 15,173,74,6,201,180,176,8,23
8,104,6,169,0,141,131,6
9460 DATA 152,41,4,208,15,173,74,6,201
,68,144,8,206,104,6,169
9470 DATA 11,141,131,6,173,126,6,208,9
2,173,132,2,240,3,24,144
9480 DATA 79,162,2,189,23,6,208,67,189
,59,6,208,62,173,131,6
9490 DATA 141,132,6,24,109,74,6,141,12
8,6,173,84,6,141,129,6
9500 DATA 169,64,157,23,6,169,0,157,48
,6,133,77,169,48,157,192
9510 DATA 2,142,130,6,206,133,6,138,10
,168,169,36,153,1,210,169
9520 DATA 3,153,0,210,169,19,141,126,6
,208,10,202,16,181,48,78
9530 DATA 173,126,6,240,73,174,130,6,1
73,126,6,74,74,168,185,154
9540 DATA 6,133,209,173,132,6,208,7,56
,169,0,229,209,133,209,24
9550 DATA 165,209,109,128,6,157,26,6,2
4,185,159,6,109,129,6,157
9560 DATA 37,6,206,126,6,208,23,169,64
,157,23,6,169,140,157,192
9570 DATA 2,169,1,157,48,6,138,10,168,
169,163,153,1,210,173,11
9580 DATA 6,133,204,162,8,189,84,6,133
,203,189,94,6,133,205,160
9590 DATA 7,177,205,145,203,136,16,249
,189,134,6,240,17,222,134,6
9600 DATA 189,134,6,74,74,74,10,10,10,
157,94,6,16,22,189,144
9610 DATA 6,157,64,6,165,20,41,1,208,1
0,24,189,74,6,125,104
9620 DATA 6,157,74,6,202,16,190,169,0,
133,204,162,2,169,5,133
9630 DATA 203,189,59,6,208,7,189,4,208
,41,4,208,65,189,12,208
9640 DATA 41,8,240,81,24,189,37,6,105,
4,133,209,160,8,185,84
9650 DATA 6,197,209,176,61,185,134,6,2
08,59,24,185,144,6,105,6
9660 DATA 153,64,6,189,23,6,201,64,208
,43,152,41,1,208,10,132
9670 DATA 204,169,14,133,203,169,55,20
8,2,169,39,153,134,6,169,27
9680 DATA 157,59,6,138,10,168,169,34,1
53,0,210,165,203,153,1,210
9690 DATA 208,3,136,208,185,202,16,149
,173,125,6,208,35,165,204,240
9700 DATA 31,24,109,133,6,144,2,169,25
5,141,133,6,164,204,152,10
9710 DATA 10,10,10,10,168,136,152,24,1
09,202,6,144,3,238,203,6
9720 DATA 162,2,189,8,6,133,204,189,12
,6,133,203,160,7,169,0
9730 DATA 145,203,136,16,251,189,37,6,
157,12,6,133,203,189,23,6
9740 DATA 133,205,160,7,177,205,145,20
3,136,16,249,138,10,168,189,26
9750 DATA 6,157,0,208,189,59,6,240,35,
222,59,6,208,10,169,0
9760 DATA 153,1,210,157,23,6,240,34,18
9,59,6,74,74,10,10,10
9770 DATA 157,23,6,173,10,210,157,192,
2,24,144,14,24,189,37,6
9780 DATA 125,48,6,157,37,6,74,153,0,2
10,202,16,149,165,20,41
9790 DATA 1,208,75,162,3,134,203,189,4
,6,133,209,188,19,6,162
9800 DATA 2,165,209,49,207,145,207,200
,202,16,246,166,203,189,44,6
9810 DATA 157,19,6,189,0,6,133,209,188
,15,6,162,2,165,209,17
9820 DATA 207,145,207,200,202,16,246,1
66,203,189,29,6,157,4,208,56
9830 DATA 189,40,6,253,51,6,157,40,6,2
02,16,185,48,73,162,3
9840 DATA 134,203,189,4,6,133,209,188,
15,6,162,2,165,209,49,207
9850 DATA 145,207,200,202,16,246,166,2
03,189,40,6,157,15,6,189,0
9860 DATA 6,133,209,188,19,6,162,2,165
,209,17,207,145,207,200,202
9870 DATA 16,246,166,203,189,33,6,157,
4,208,56,189,44,6,253,55
9880 DATA 6,157,44,6,202,16,185,141,30
,208,76,98,228
```

**Get it right!**

| LINE | CHSUM | LINE | CHSUM | LINE | CHSUM |
|---|---|---|---|---|---|
| 1 | CAJ (W) | 599 | EJW (P) | 2499 | E9P (S) |
| 2 | CAK (3) | 600 | VVD (5) | 2500 | Y7Q (3) |
| 3 | CAL (V) | 620 | WCQ (Q) | 2899 | ESP (1) |
| 5 | P5C (M) | 650 | A4G (6) | 2900 | LHN (7) |
| 49 | DT4 (A) | 660 | T5F (W) | 2999 | EWP (5) |
| 50 | VME (K) | 680 | GPV (X) | 3000 | HKH (Q) |
| 70 | 9WP (C) | 699 | EJX (J) | 4199 | DWR (Q) |
| 99 | DT9 (R) | 700 | 694 (4) | 4200 | 9VM (U) |
| 100 | VJN (J) | 710 | LPN (1) | 4210 | 97G (V) |
| 110 | LCG (D) | 720 | U8D (4) | 4220 | 2J8 (3) |
| 120 | VW7 (5) | 740 | A97 (6) | 4230 | 5XL (4) |
| 140 | H7V (M) | 799 | EJY (8) | 4240 | 1V5 (C) |
| 190 | 7YN (4) | 810 | EMV (J) | 4250 | GHG (P) |
| 199 | EJS (D) | 820 | XYQ (2) | 4260 | 31N (F) |
| 200 | UKJ (G) | 830 | 51R (3) | 4270 | P7Y (3) |
| 210 | 9LQ (J) | 840 | 51R (1) | 4280 | G6G (T) |
| 220 | 93C (Q) | 850 | 51R (4) | 4999 | EWR (X) |
| 230 | D7X (K) | 860 | YGG (E) | 5000 | J98 (P) |
| 240 | EQR (P) | 870 | 4NM (G) | 6999 | EWT (H) |
| 250 | 15A (L) | 880 | 4SD (K) | 7000 | HC3 (W) |
| 280 | 4V5 (F) | 890 | 4W4 (7) | 7010 | GUU (L) |
| 299 | EJT (5) | 900 | 49S (1) | 7020 | 6QR (6) |
| 300 | 843 (T) | 910 | Q3G (U) | 7030 | QWN (3) |
| 320 | 47P (X) | 920 | 4ES (W) | 7040 | VRJ (F) |
| 330 | MAY (P) | 930 | QCG (6) | 7050 | C2R (L) |
| 340 | S9C (K) | 940 | 4JS (3) | 7060 | 07J (K) |
| 360 | NFT (J) | 950 | QLG (U) | 7070 | OCL (7) |
| 380 | KJN (Y) | 960 | 4NS (V) | 7090 | LOK (D) |
| 390 | 9FJ (A) | 970 | QUG (5) | 7300 | 2U3 (H) |
| 399 | EJU (O) | 980 | R5A (Q) | 7399 | E5U (K) |
| 400 | CPL (F) | 990 | 4WS (Q) | 7400 | 5HM (W) |
| 410 | MN7 (K) | 1000 | NGV (G) | 7410 | 2W4 (6) |
| 420 | A2N (5) | 1010 | 5LT (8) | 7440 | EA2 (T) |
| 430 | SVR (G) | 1020 | EFS (K) | 7450 | DE1 (M) |
| 440 | 270 (H) | 1030 | 5UR (Q) | 7460 | D03 (S) |
| 450 | 3T6 (A) | 1040 | NQV (F) | 7470 | A25 (Y) |
| 460 | 6RO (R) | 1050 | NSV (Q) | 7499 | E9U (X) |
| 470 | LED (W) | 1060 | EQ1 (M) | 7500 | CK9 (T) |
| 499 | EJV (H) | 1070 | 61D (4) | 7520 | 48N (M) |
| 500 | LHC (1) | 1080 | NYV (X) | 7540 | 5PJ (2) |
| 510 | LLK (F) | 1090 | 67M (5) | 7600 | 2FH (3) |
| 530 | 5XO (P) | 1100 | 5SH (R) | 7610 | C8V (Q) |
| 540 | UJ4 (J) | 1110 | L8R (K) | 7620 | LRL (W) |
| 550 | W3P (T) | 1999 | EWN (L) | 7630 | 8VH (4) |
| 560 | RHL (T) | 2000 | EFT (W) | 7640 | F18 (M) |

| LINE | CHSUM | LINE | CHSUM | LINE | CHSUM |
|---|---|---|---|---|---|
| 7650 | VE3 (8) | 8600 | 8WJ (A) | 9400 | 1JJ (Q) |
| 7660 | V69 (R) | 8699 | EJV (5) | 9410 | 071 (K) |
| 7670 | 6AP (N) | 8700 | FQ7 (M) | 9420 | 05N (H) |
| 7680 | VRQ (7) | 8710 | OC7 (A) | 9430 | YW4 (O) |
| 7690 | DDY (A) | 8720 | V8T (F) | 9440 | XKS (N) |
| 7700 | 1WT (6) | 8730 | 455 (A) | 9450 | XW4 (3) |
| 7710 | A63 (H) | 8800 | 4F3 (W) | 9460 | XTG (T) |
| 7720 | 2VO (1) | 8810 | LJU (O) | 9470 | 0J6 (D) |
| 7730 | C2R (H) | 8820 | 232 (2) | 9480 | XV9 (6) |
| 7740 | QPQ (Y) | 8830 | LCO (W) | 9490 | OFL (W) |
| 7750 | Q3X (R) | 8840 | OLD (P) | 9500 | 2GJ (M) |
| 7760 | ODT (X) | 8850 | VXC (J) | 9510 | YV4 (O) |
| 7770 | 8L2 (E) | 8860 | ER7 (9) | 9520 | YNN (L) |
| 7780 | QKM (1) | 8870 | 935 (6) | 9530 | 01H (A) |
| 7790 | CO2 (G) | 8880 | TSW (O) | 9540 | 1H5 (6) |
| 7800 | P9J (X) | 8899 | ESV (8) | 9550 | YSW (8) |
| 7900 | JY8 (W) | 8900 | RP5 (6) | 9560 | 4A8 (T) |
| 7999 | EWU (T) | 8920 | TA2 (X) | 9570 | Y34 (4) |
| 8000 | D4Q (S) | 8950 | HDW (3) | 9580 | 058 (P) |
| 8020 | NSL (S) | 8999 | EWV (C) | 9590 | 249 (E) |
| 8030 | HSK (J) | 9000 | 4SA (2) | 9600 | WGA (K) |
| 8040 | NKV (S) | 9010 | XTS (Q) | 9610 | WGE (H) |
| 8050 | MFX (P) | 9020 | RU1 (M) | 9620 | Y7A (P) |
| 8060 | JV3 (E) | 9030 | LJR (4) | 9630 | YKO (M) |
| 8070 | TJF (1) | 9050 | 859 (K) | 9640 | YEU (V) |
| 8080 | XOG (E) | 9060 | 7CL (3) | 9650 | 1PE (S) |
| 8090 | 6PS (N) | 9070 | NW1 (8) | 9660 | XPF (J) |
| 8100 | 3SK (6) | 9080 | R9L (F) | 9670 | 10K (U) |
| 8110 | YKJ (C) | 9090 | 52H (V) | 9680 | YWV (N) |
| 8120 | X5L (Y) | 9199 | DWW (J) | 9690 | E05 (W) |
| 8130 | HUX (A) | 9200 | YJ2 (M) | 9700 | 079 (9) |
| 8299 | E1V (7) | 9210 | VRE (M) | 9710 | XH3 (C) |
| 8300 | L8X (Y) | 9220 | OVC (M) | 9720 | 2QU (A) |
| 8320 | XH7 (A) | 9230 | 09V (3) | 9730 | ORQ (U) |
| 8330 | RP8 (N) | 9240 | M4Q (M) | 9740 | DLJ (4) |
| 8340 | XYD (4) | 9250 | XRY (F) | 9750 | VCK (1) |
| 8360 | LGF (7) | 9260 | 1EP (E) | 9760 | XNP (K) |
| 8370 | TN7 (U) | 9270 | 1LD (S) | 9770 | YNW (J) |
| 8399 | E5V (P) | 9280 | OGR (J) | 9780 | OE5 (8) |
| 8400 | XH7 (H) | 9290 | XC7 (J) | 9790 | 17S (V) |
| 8410 | K3E (6) | 9300 | YUT (K) | 9800 | 7EN (A) |
| 8420 | R5S (X) | 9310 | 07C (6) | 9810 | YFK (A) |
| 8499 | E9V (H) | 9320 | UKO (S) | 9820 | 6MC (H) |
| 8500 | XQC (A) | 9330 | XVY (6) | 9830 | WX7 (K) |
| 8510 | U32 (6) | 9340 | 2PX (7) | 9840 | OTM (E) |
| 8520 | H1H (R) | 9350 | YK1 (K) | 9850 | OLS (N) |
| 8530 | 002 (R) | 9360 | Y12 (G) | 9860 | 1GJ (K) |
| 8540 | 7S6 (3) | 9370 | YTA (4) | 9870 | 2RO (D) |
| 8550 | XXP (M) | 9380 | ONP (L) | 9880 | N67 (H) |
| 8599 | EEV (T) | 9390 | OPC (O) | | |

# Spoiled for choice?

## Steve Gold explains what to look for when buying your first quality modem

**WHEN I bought my first modem – way back in 1983 – my choice was fairly limited, mostly in terms of price. In 1983 the modem market for Atari computers was split into the sub-£100 bracket for acoustic 300/300 and 1200/75 baud modems, while you had to look at spending £300 or more even for a simple direct-connect no frills model.**

Today the situation is very different. Modems are even being given away by some online services in a bid to get subscribers to sign on the dotted line for a year or more.

So what criteria should the beginner apply when he sets out to choose a modem?

To my mind (and I would stress this is a personal opinion only – based on several year's usage), the key factors to be borne in mind when choosing a modem are – in no particular order – price, Hayes compatibility, ease of use, and reliability of construction.

As with most things, price is a major factor in the modem market. Ignoring the freebie modems (which are generally costed in with your first year's subscription to the service offering it), the cheapest modems on the market today start at around the £20 mark.

For your money you usually get a direct-connect unit (a modem that plugs straight into a telephone socket) that has a simple switch taking it on or off line as required. Most of the modems in this price bracket work at 1200/75.

For the beginner, such modems are ideal for the first few months, but automated logons – so necessary for the smooth operation of communications programs – save a lot of time and effort for the ex-novice. The route to automated logons is good communications software and Hayes compatibility.

The Hayes standard – sometimes called the Hayes protocol – is a simple modem control language first used by the Hayes modem corporation in the US. Developed by Dennis Hayes, the modem company's owner, it first appeared in Hayes modems in the early part of this decade.

As with all good ideas, the Hayes command language is fairly simple by design. All commands to the modem (while in an off-line state) are prefixed by the command AT (short for ATtention) and subsequent commands are mnemonic. A list of the basic commands in the Hayes command language set is given in Figure I.

Unlike several other proprietary modem control systems of its genre, the Hayes command set was placed into the public domain by Hayes, so that other modem manufacturers might adopt the standard – thereby making it universal.

The idea caught on and by 1983 the majority of medium to high-priced modems on sale in the US had some form of Hayes command language built into them.

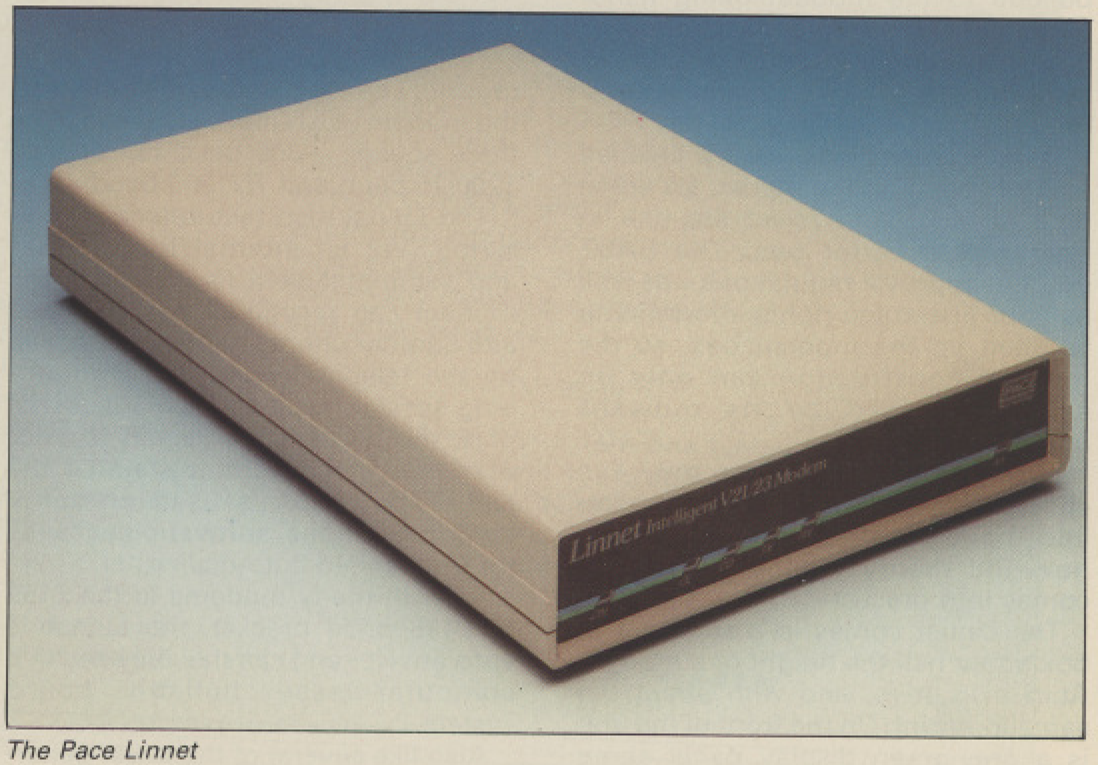
At that time modems were only just beginning to penetrate the home and small business user market in the UK. As with most American originated ideas (good or bad) it took a few years for the idea of Hayes compatibility to

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| | |
|---|---|
| **A** | *Answer call* |
| **C** | *Carrier control C0=OFF, C1=ON* |
| **D** | *Modem dialing prefix* |
| **E** | *Echo commands E0=OFF, E1=ON* |
| **F** | *Echo data F0=ON, F1=OFF* |
| **H** | *Take modem off line (hang up – used in conjunction with +++ command prefix – see below)* |
| **I(n)** | *Display identity (n=0,1,2)* |
| **L(n)** | *Speaker loudness (n=1,2,3)* |
| **M(n)** | *Monitor status (n=0,1,2)* |
| **N** | *Display/set number store* |
| **O** | *Go online* |
| **P** | *Pulse dialing prefix* |
| **R** | *Reverse to answer after dialing* |
| **T** | *Tone dialing prefix* |
| **W** | *Wait for secondary dial tone* |
| **Z** | *Modem resets* |

*+++ Instructs modem to interpret next command string locally and not transmit the string. Usually used to take modem off line using the H command above. For example +++ ATH. This command set may vary from modem to modem).*

*Figure I: The basic Hayes command set*




*The Pace Linnet*

◄ From Page 37

percolate through to the UK modem market.

By 1985, the Hayes command language was beginning to appear in several high-end (£300 plus) modems and – at last – people were beginning to realise what a useful facility the Hayes command set is.

Today, most modems priced above the budget market (£20 to £50) are Hayes compatible, or have a low-cost option for the facility to be fitted by the modem manufacturer.

Ease of use is another important criteria that is often overlooked by many modem buyers and, amazingly, modem designers themselves.

Hayes compatibility is a major step towards ease of use, but some modems (which shall remain nameless) have a front-panel control system that defies all logical explanation.

Because the Hayes command language is so comprehensive, most of the modems on sale today only need one control switch on the unit itself – the on/off switch – the remainder of the modem controls can easily be handled by a series of Hayes commands piped down the modem's serial port.

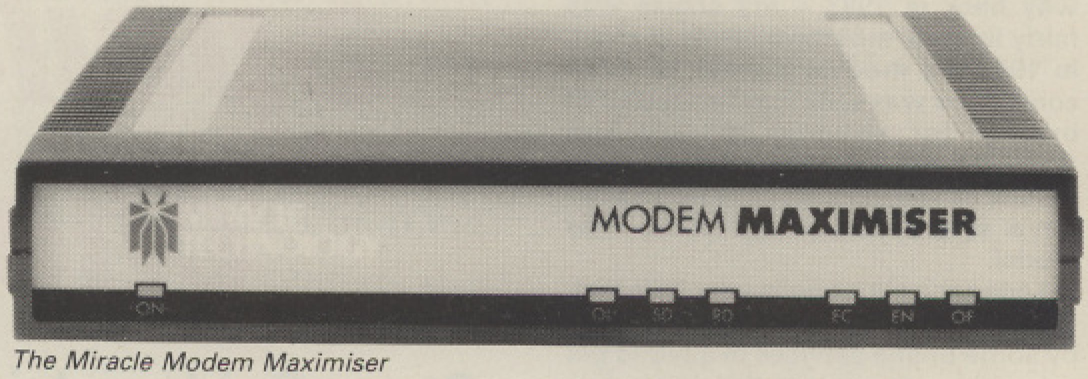
Like a good car, the quality of a modem's construction – its pedigree if you like – can usually be spotted by careful examination of the case.

Tell-tale signs such as slippage marks at the point where screws or retaining clips are fitted, along with a bad finish generally, tend to indicate a modem is not professionally produced. If it is relatively new on the market, the casing's lack of finish may be due to the modem being hand-built, but you should question your dealer thoroughly as to the number sold and the number of satisfied customers.

If the modem looks badly finished and has been on the market for some time, it is best to reject the unit in favour of a better one. The BABT modem approval regulations – as well as your guarantee rights – forbid you to open up the modem box, so the internal construction can only be easily assessed by its outward appearance.

For illustrative purposes only I've chosen the Pace Linnet Hayes compatible modem to look at and explain how the theory behind this article comes into practice.

The Linnet comes in a small beige box about half the height of a modern Atari disc drive, and with about the same footprint. On the front of the unit is a grey-green display panel along with six red status lights, which indicate the current state of the modem.



*The Miracle Modem Maximiser*

As well as using the Hayes command set, the Linnet is capable of pulse and tone dialing – useful for speed-dialing on more modern telephone exchanges and office PABXs.

Limited speed-buffering is available so that, if you wish to communicate at 1200 baud full duplex constantly (possibly due to a software limitation), the modem will buffer data down to its three speeds – 300 baud full duplex, 1200/75 baud and 75/1200 baud.

**❛ The internal construction can only be assessed by its outward appearance ❜**

The Linnet also features call monitoring. Via an internal loudspeaker and semi-intelligent line sensing, the modem can recognise dial, engaged and number unobtainable tones found on the telephone network. By returning special result codes via its serial port, the modem can signal to your Atari micro the current state of the call. This option is used on some communications software packages for unattended auto-dialing.

As with many modems in the £139 to £195 price bracket, the Linnet is auto-answer and can thus be used in a computer-based bulletin board system.

Also like several of the latest generation of modems, the Pace Linnet is entirely software controlled. Commands sent via its serial port are interpreted by an onboard eprom and translated into specific modem commands.

The software – which occupies a single 16k eprom on the modem's PCB – functions in a similar fashion to your Atari's Basic interpreter, translating the Hayes commands into direct instructions to the modem components.

Modems are changing all the time and recently another manufacturer – Miracle Technology – unveiled an add-on, the Modem Maximiser.

Designed to complement any Hayes-compatible modem, the Maximiser costs £225-00 (£99-00 extra for the data encryption option), and adds a range of features to even the most basic of Hayes-compatible modems.

Features of the Maximiser include: Error-correction to Mpad, Epad and Xmodem protocols, data compression and encryption, data storage – a 16k serial buffer comes as standard, 9600 baud speed buffering, and a centronics printer port for connection to a printer in the absence of your computer being switched on.

Although the Maximiser is a rather pricey add-on for many modem owners, it does indicate the way that the modem market is going. It seems more than likely that at least some of the facilities found on the Maximiser will be incorporated in future generations of modems, in much the same way that the Hayes command set is almost universal in today's quality modems.

*Further details are available from:*
*Pace Linnet: Pace Micro Technology, Allerton Road, Bradford, BD15 7AG.*
*Tel: 0274-488211.*
*Modem Maximiser: Miracle Technology, St Peters Street, Ipswich, IP1 1XB.*
*Tel: 0473-216141.*

# Programming the easy way!

## LEN GOLDING takes you on a journey into the wonderful world of Atari Basic

**IN this new series we'll be exploring the wonders of Atari Basic from square one, and showing how even an absolute beginner can quickly learn to produce interesting and worthwhile programs. We'll start by explaining some of the fundamental things they don't bother to tell you in the manuals, then progress to sound, colour, graphics and some advanced programming techniques.**

First let's assume that all you've read are the booklets which came with your computer – so you know how to plug all the various bits and pieces together, can find your way around the keyboard and maybe you've tried typing in one or two of the sample programs. So now what? Where do you go from here?

The Basic reference book gives you a list of words that the computer can understand, but it doesn't try very hard to make these comprehensible to humans. Terms like variable, string, function, register, channel and IOCB are liberally sprinkled around, and there's little attempt to explain what they are, let alone how to use them.

As an example, try reading the sections on COLOR and SETCOLOR – you'll soon see what I mean.

Fortunately, programming isn't nearly as difficult as it looks. Basically – excuse the pun – its all about following strict rules: Once you've learned the rules and can apply them correctly, your computer will turn into an obedient servant, instead of an uncooperative little monster.

So let's start at the very beginning, by defining a few terms. A program is nothing more than a set of instructions, phrased in a way that the computer can understand, and arranged in a carefully worked-out order.

Every program consists of at least one program line, which may contain as many as 100 characters – letters, numbers or symbols – so it could easily occupy up to three lines on your TV screen.

Every program line must start with a line number, and the computer automatically shuffles the lines around in its memory so that they are always arranged in numerical order, with the lowest first. This will happen regardless of the order in which you typed the lines.

Every line number must be followed by at least one command, which might be a single word such as PRINT, LIST, REM or END, but will usually have extra letters or numbers tagged on to it. Some examples are:

```
PRINT "So far so good"
REM Program I
OPEN #1,4,0,"C:"
LET C$="Useless!"
```

Don't worry if this still looks like a foreign language – we'll explain it all shortly.

Every command has its own rules which tell you what extra bits and pieces have to be tagged on, and the order in which they must appear. These are known collectively as the rules of SYNTAX, and if you get them wrong the computer will not accept your program line when you hit the Return key. Let's pause for breath and look at an example:

```
10 PRINT "HELLO"
```

This is a valid program line which your computer will understand and obey. It starts with a line number – 10 – then it has a command PRINT followed by an extra group of characters "HELLO".

The rules of syntax for the PRINT

*Turn to Page 41* ▶

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command state that if you want it to print a group of characters exactly as they appear on the program line, you must enclose those characters in inverted commas. If you leave the commas out, the computer will misunderstand your intention and print the number 0. Why does it do this? Read on.

There are two other terms you need to understand before you can write any worthwhile programs: Numeric variable and string. Let's look at numeric variables first.

Every numeric variable has a "name", such as X or LIFE or LEVEL, and a corresponding numeric value such as 5, 0.003, –256 or 56000000. Remember how in algebra you can write Let X = 50? Well, to your computer the letter X would be a variable name, and the number 50 would be its value.

The name remains constant throughout your program, but its value can change as many times as you like. So whenever you tell the computer to print the value of X, it will give you the number that X represents at that particular moment.

A variable name need not be a single letter, but it must begin with a capital letter, and can contain only capital letters or numbers – symbols such as % or # are not allowed.

If we go back to our previous example PRINT "HELLO", you will recall we said that leaving out the inverted commas would make the computer give you the number zero. Now can you see why?

It's because the computer will assume that HELLO – without inverted commas – is a variable name, so it promptly starts to search for the numeric value which HELLO represents. It can't find one, so it assumes that the answer must be zero. You therefore get 0 printed on the screen, much to your annoyance. See how a small change can produce major differences in the computer's behaviour?

We'll return to variables next time, but now let's turn to the related subject of strings. A string is a sequence of characters grouped together in any way you fancy. This month we'll look at the two main types, literal strings and string variables.

A literal string is a group of characters enclosed by inverted commas – like "HELLO", or "So far so good", or "Useless". When told to print a literal string, the computer will print everything inside the inverted commas, exactly as it appears in the program line. You can put almost anything in a literal string, apart from the double-quote character (") itself. Experiment with a few and see.

String variables are a bit trickier to understand, but like numeric variables they have names made up from capital letters and numbers, but all string names must end with a dollar sign $. For example:

```
A$
MONTHS$
MESSAGES
```

Each name can represent a group of characters. Lets say, for example, that you have a variable called A$ which contains the characters: "READY FOR ACTION". If you now tell the computer to PRINT A$, it will respond by printing READY FOR ACTION, just as though you'd told it to print the characters themselves. The variable name and its contents are interchangeable, so as far as the computer is concerned.

Suppose, though, you had told it to PRINT "A$" What do you think you'd get, and why?

As with numeric variables, the name which identifies a particular string will remain constant, though its value – the characters in the string – can change. So at the beginning of your program, a string variable called LIVES$ could contain the words "ALL LIVES INTACT", while at the end of the program it could contain "NO LIVES LEFT".

The awkward thing about string variables is that you can't just write them straight into a program. This is because your computer needs to know how much memory it must set aside to hold the string's characters. If you had a program line like this:

```
10 A$="So far so good"
```

You would need to reserve space for at least 14 characters – 11 letters and three spaces.

This process of reserving memory is called dimensioning – for obvious reasons – and there is a special command – DIM – for doing it. To reserve space for up to 20 characters in a variable called A$, you would type:

```
10 DIM A$(20)
```

For up to 50 characters in a variable

Turn to Page 42 ▶

◀ From Page 41

called MESSAGE$ you would type:

```
10 DIM MESSAGE$(50)
```

The number in brackets is the number of character count. You don't need to use all the reserved space, but you mustn't exceed it or you will lose the excess characters.

Once a string variable has been dimensioned, you can specify its contents in a number of ways. Here are two simple examples:

```
10 DIM M$(20)
20 LET M$="WELL DONE SO FAR"
30 PRINT M$
```

or:

```
10 DIM NAME$(40)
20 PRINT "Please tell me your name"
30 INPUT NAME$
40 PRINT "HELLO"
50 PRINT NAME$
```

The second of these programs uses two literal strings and one string variable. Can you identify them? Line 30 contains a new command – INPUT. This tells the computer to wait until you've typed something and pressed Return, then it proceeds with the program.

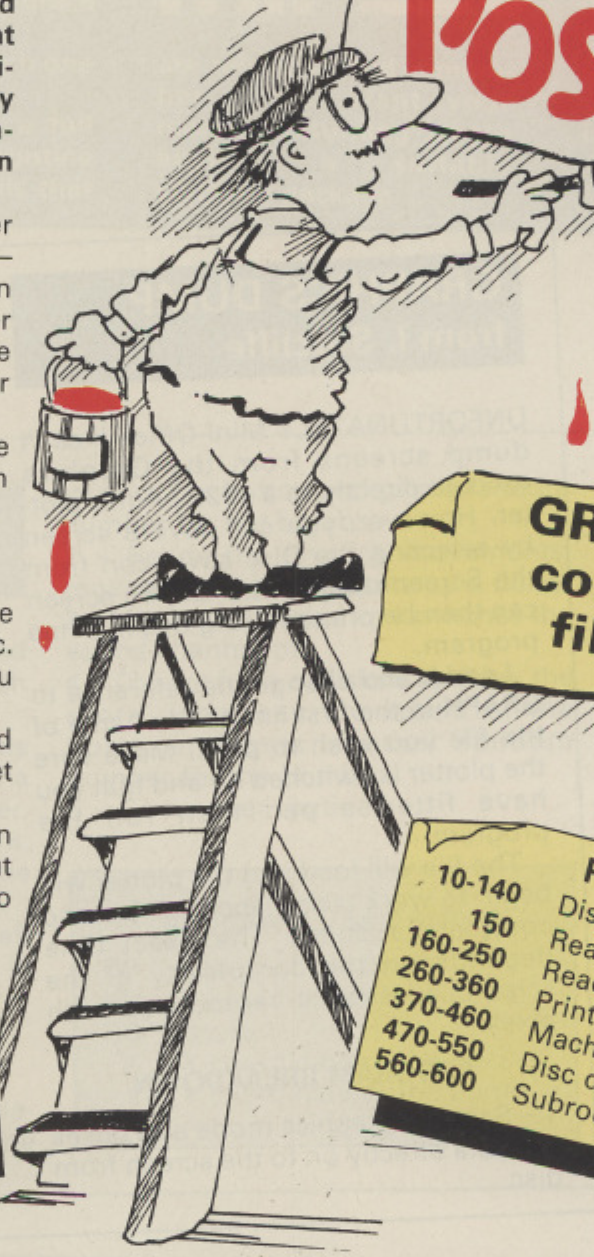
It adds a direct link between you and the computer, and whatever you have typed will be called NAME$ for the duration of the program – so don't type Bananaface unless you're happy to be stuck with it!

Numeric and string variables are among the most difficult things to master when you're starting out at first, but you must understand them before you can progress very far. So why not read through this article again, and have a go at writing a few programs of your own?

● *Next month we'll look at a few more interesting commands, including the SOUND statement, and show how your knowledge of variables can be put to an entertaining use.*

# Poster Printer

## GRANVILLE DANBY convert AtariArtist files into posters



**HAVE you ever wished that you could make a poster out of a picture that you have drawn using your Atari-Artist cartridge? Well here is a utility that will take a 62-sector, uncompressed file and create one using an Atari 1029 dot matrix printer.**

The program will print out a poster approximately 38 by 43 centimetres – that's larger than a sheet of A3 – in four shades of grey that the computer automatically assigns to each of the colour registers for that particular picture.

When the program is run you are prompted for the filename, which must be entered like this:

```
D:FILENAME.PIC
```

or you can just press Return, to be presented with a directory of the disc. Pressing the spacebar will return you to the load file option.

Once a picture has been loaded press P to send it to the printer, and let the program do the rest.

The printout routine is written in machine code and will only take about 15 minutes to dump the poster in two halves – the bottom half first.

### VARIABLES

| | |
|---|---|
| FN$ | Picture filename |
| DA$ | Buffer for disc directory |
| K | Value of key pressed |
| X,Y | Picture coordinates |

### PROGRAM BREAKDOWN

| | |
|---|---|
| 10-140 | Display text and get the picture filename |
| 150 | Reads machine code data |
| 160-250 | Read the picture and wait for a keypress |
| 260-360 | Print the picture |
| 370-460 | Machine code data |
| 470-550 | Disc directory routine |
| 560-600 | Subroutine to wait for keypress |

```
10 REM *************************
20 REM * GIANT POSTER PRINTER *
30 REM *  BY GRANVILLE DANBY  *
40 REM *    (c) ATARI USER    *
50 REM *************************
70 GRAPHICS 0:SETCOLOR 4,9,2:SETCOLOR
2,0,0:POKE 82,0:POKE 752,1
80 DIM FN$(20),DA$(20)
90 POSITION 12,2:? "POSTER PRINTER":PO
SITION 12,3:? "--------------"
100 ? :? "  ENTER PICTURE FILENAME,eg,
D:PICTURE"
110 ? "   OR PRESS RETURN FOR DISK DIR
ECTORY"
120 TRAP 100
130 ? :INPUT FN$
140 IF FN$="" THEN 480
150 FOR X=1536 TO 1708:READ Y:POKE X,Y
:NEXT X
160 REM *** READ IN PICTURE ***
170 GRAPHICS 15+16
180 CLOSE #1:OPEN #1,4,0,FN$
190 POKE 708,10:POKE 709,6:POKE 710,0:
POKE 712,13
200 Q=USR(1677)
210 GOSUB 570
220 IF K<>80 THEN 210
230 FOR S=20 TO 100 STEP 0.5
240 SOUND 2,S,S/20,S/20+5
250 NEXT S
260 REM *** PRINT POSTER ***
270 POKE 84,192:POKE 85,0:POKE 86,0:PO
KE 1655,0:DY=192:X=0
280 CLOSE #1:OPEN #1,8,0,"P:"
290 ? #1;CHR$(27);CHR$(57);CHR$(27);CH
R$(65);CHR$(1);CHR$(224);
300 Z=USR(1536)
310 X=X+1:POKE 1655,X:POKE 84,DY:IF X<
159 THEN 280
320 IF DY=96 THEN END
330 DY=96:POKE 84,DY:POKE 1655,0:X=0:P
OKE 85,0
340 LPRINT :LPRINT :LPRINT :LPRINT
350 POKE 1542,255
360 GOTO 280
370 REM *** MACHINE CODE DATA ***
380 DATA 164,84,136,132,84,192,95,208,
2,104,96,32,118,6,162,16,201,0,208,13
390 DATA 169,98,157,68,3,169,6,157,69,
3,76,77,6,201,1,208,13,169,103,157
400 DATA 68,3,169,6,157,69,3,76,77,6,2
01,2,208,13,169,108,157,68,3,169
410 DATA 6,157,69,3,76,77,6,169,113,15
7,68,3,169,6,157,69,3,169,11,157
420 DATA 66,3,169,5,157,72,3,169,0,157
,73,3,32,86,228,76,0,6,0,0
430 DATA 0,0,0,34,72,34,72,20,108,87,5
7,87,90,127,127,127,127,127,169,7
440 DATA 133,85,162,96,169,7,157,66,3,
169,0,157,72,3,157,73,3,32,86,228
450 DATA 96,162,16,169,7,157,66,3,165,
88,157,68,3,165,89,157,69,3,169,0
460 DATA 157,72,3,169,30,157,73,3,32,8
6,228,104,96
470 REM *** DISK DIRECTORY ***
480 TRAP 520:OPEN #1,6,0,"D:*.*"
490 INPUT #1,DA$
500 ? DA$,
510 GOTO 490
520 ? :? :? "         PRESS  SPACE  TO
CONTINUE"
530 CLOSE #1:GOSUB 570
540 IF K<>32 THEN 570
550 RUN
560 REM *** GET A KEY ***
570 CLOSE #1:OPEN #1,4,0,"K:"
580 GET #1,K
590 CLOSE #1
600 RETURN
```

**Get it right!**

| | | |
|---|---|---|
| 10 CP1 (Y) | 220 43V (2) | |
| 20 CP2 (3) | 230 JCP (T) | 420 O2U (Y) |
| 30 CP3 (X) | 240 4E5 (E) | 430 D38 (S) |
| 40 CP4 (4) | 250 QC2 (3) | 440 JCQ (U) |
| 50 CP5 (Y) | 260 DLT (E) | 450 GV8 (2) |
| 70 PV6 (C) | 270 FQ9 (2) | 460 HY3 (N) |
| 80 YVL (F) | 280 CQN (G) | 470 DQV (W) |
| 90 12W (4) | 290 AV9 (G) | 480 GFO (A) |
| 100 KRC (3) | 300 QLC (S) | 490 PQX (O) |
| 110 RY7 (1) | 310 W2A (K) | 500 J6U (P) |
| 120 QA5 (1) | 320 6WD (S) | 510 QYC (O) |
| 130 YFS (J) | 330 KS3 (7) | 520 7GQ (F) |
| 140 5VH (3) | 340 CDL (1) | 530 3GC (P) |
| 150 PSC (A) | 350 SJ8 (X) | 540 4GY (N) |
| 160 DLS (7) | 360 R99 (F) | 550 DYN (4) |
| 170 51O (L) | 370 DQU (1) | 560 DLW (E) |
| 180 FUM (9) | 380 R57 (Y) | 570 C8R (6) |
| 190 NPK (R) | 390 HYD (9) | 580 RCO (J) |
| 200 QK2 (Q) | 400 F93 (K) | 590 N2D (6) |
| 210 P7K (6) | 410 E6Y (4) | 600 R6A (9) |

# 5 LINERS

## GRAPHICS DUMP
### from I. Sutcliffe

UNFORTUNATELY Mini Office II can't dump screens from the Graphics module directly to a 1020 printer plotter. However, you can save a screen by selecting the Disc save icon from the Screen options menu. The screen can then be printed using this five-line program.

Load it and change the reference to GRAPH in the first line to the name of the file you wish to print. Make sure the plotter is switched on and that you have fitted a pen then run the program.

The file will load and the plotter will begin to work taking about an hour to complete a dump. The exact time depends on the complexity of the screen, because it reproduces each pixel.

**PROGRAM BREAKDOWN**

**1** – Sets the graphics mode and pokes the data directly on to the screen from disc.

**2** – Initialises the plotter.

**3** – Using the values obtained from the loops *X* and *Y* it locates a pixel on the screen. It then works out if it is a solid block – 1 – or if the pixel is a blank – 0.

**4** – Sends the correct printer codes to the 1020 and plots them.

**5** – Moves to the next position on the paper. At the end of a screen column it moves the paper up to the start of the next column.

```
10 LPRINT :GRAPHICS 8:SC=PEEK(88)+PEEK
(89)*256:OPEN #1,4,0,"D:GRAPH":FOR I=0
 TO 6180:GET #1,A:POKE SC+I,A:NEXT I
20 CLOSE #1:OPEN #1,8,0,"P:":? #1;"E\"
:? #1;"C0":FOR X=10 TO 262
30 FOR Y=151 TO 7 STEP -1:LOCATE X,Y,C
:IF C=0 THEN 50
40 ? #1;"D2,0*M0,-2*D2,-2"
50 ? #1;"M3,0":? #1;"I":NEXT Y:? #1;"M
-435,-3":? #1;"I":NEXT X
```

Get it right!

```
10 9U8 (6)
20 74Q (W)
30 38Y (M)
40 9Q4 (Y)
50 CCF (X)
```

## DAY-FINDER
### from S. O'Hanrahan

HAVE you ever wondered what day a particular date fell on? This useful little program will tell you the answer. It prompts you for a specific date, which you must enter in the form of day, month, and year with each separated either by a comma or Return.

Note that the day should be a number from 0 to 31, the month from 1 to 12 and the year should be four digits such as 1988. The day corresponding to that date will then be output.

**PROGRAM BREAKDOWN**

**10** – Sets up *DAY$* – the string that holds the answer.

**20** – Gets the variables *D*, *M* and *Y* from the user. These correspond to day, month and year. It also places the value of *Y* into *Y1*.

**30** – Calculates the value of *R* minus a number from one to seven.

**40** – Reads the data statements and chooses day *R*. Prints the original date you entered followed by the day.

**50** – Clears the screen, prints the title and holds the data statements.

```
10 GOSUB 50:SETCOLOR 2,0,0:RESTORE :DI
M DAY$(6):POSITION 2,4:? "Please give
your date as follows:"
20 TRAP 20:POSITION 2,6:? "DATE/MONTH/
YEAR ( / is RETURN)":INPUT D,M,Y:Y1=Y
30 X=INT(0.6+1/M):Q=Y-X:P=M+12*X:C=Q/1
00:Y=INT(C):Z=INT(C/4):X=INT(5*Q/4):W=
INT(13*(P+1)/5):R=W+X-Y+Z+D+5
40 R=R-(7*INT(R/7))+1:FOR A=1 TO R:REA
D DAY$:NEXT A:POSITION 5,11:? D;".";M;
".";Y1;" was a ";DAY$;"day.":? "":END

50 ? "K":POSITION 6,1:? "DAY-FINDER by
 S.A.O'Hanrahan":RETURN :DATA Mon,Tues
,Wednes,Thurs,Fri,Satur,Sun
```




Get it right!

```
10 4H3 (S)
20 H7C (H)
30 2UR (4)
40 Q4T (T)
50 PN4 (3)
```

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## THE CATCH
### from Roy Escott

BOMBS are falling from the sky and your only hope of survival is to catch them in your bucket of water.

Each successive missile descends faster than the last and if you miss one it will explode and the game is over. For each caught you will gain a point, and your score will be displayed at the end of the game.

You can move the bucket from left to right using a joystick plugged in port one.

**PROGRAM BREAKDOWN**

**1** – Draws the screen, assigns the relative values to the variables, reads the joystick fire button and gets a random number for the bomb.

**2** – Reads the joystick movements, moves the bomb and sets up a delay.

**3** – Moves the bucket and switches the sound channel off.

**4** – Checks for a collision, updates the score, increases the speed of the bomb and gets another random number for the bomb.

**5** – Game over routine.

**PROGRAM VARIABLES**

| | |
|---|---|
| **SP** | Speed of the bomb. |
| **XB** | X coordinate of the bomb. |
| **SC** | Score. |
| **X** | X coordinate of the bucket. |
| **Y** | Y coordinate of the bomb. |

```
1 X=9:SP=60:GRAPHICS 18:XB=INT(15*RND(
0))+3:POSITION 5,2:? #6;"pRESs FiRe!":
GRAPHICS 18:F=STRIG(0):ON F=1 GOTO 1
2 S=STICK(0):X=X+(S=7 AND X<15)-(S=11
AND X>2):POSITION XB,Y:? #6;"*":FOR D=
1 TO SP:NEXT D
3 POSITION XB,Y:? #6;" ":Y=Y+1:POSITIO
N X-1,11:? #6;" (█) ":SOUND 0,0,0,0:ON
 Y<>12 GOTO 2
4 ON XB<>X AND XB<>X+1 AND XB<>X+2 GOT
O 5:SC=SC+1:SP=SP-1:Y=0:XB=INT(15*RND(
0))+3:SOUND 0,15,10,10:GOTO 2
5 POSITION 5,3:? #6;"GaMe OVER!":POSIT
ION 6,6:? #6;"SCORE=";SC:FOR D=0 TO 25
5:SOUND 0,D,8,15:NEXT D:RUN
```

**Get it right!**

```
1 FKA (8)
2 8SW (M)
3 PF4 (Y)
4 985 (V)
5 T9F (K)
```

## SUB ZERO ESCAPE
### from Robert Crew and Andrew Homer

YOU are the captain of a submarine lost under the North Pole. A collision with an iceberg has resulted in severe damage to the steering gear and engine room and the sonar is no longer functioning.

You have limited power left and the situation looks hopeless but you can still move south or blow the tanks to go up. You also know there is an exit somewhere in the submerged caverns. An experienced skipper could save the submarine – but can you?

**ABBREVIATIONS**

| | |
|---|---|
| GOTO | G. |
| INPUT | I. |
| PRINT | ? |

**USE KEYS**

| | |
|---|---|
| SOUTH | S |
| UP | U |

There's only one way to find out.

Before typing in the game you must enter POKE 82,0 to alter the screen margin. Leave out all unnecessary spaces and use the abbreviated commands shown for GOTO, INPUT and PRINT to allow four screen lines to be entered for each program line.

However, once you have typed them in like this they cannot be edited in the conventional way so if you make a mistake the whole line must be entered again. The lines will fit, so just take care as you type them in.

The program is written in Basic and to avoid spoiling the game by giving clues no detailed description is given. However, it is worth noting that lines 10, 40 and 50 are used to set the game up.

Lines 20 and 30 control its operation, including sorting inputs, monitoring the position of the sub, incrementing the score and determining whether the game has been finished.

Lines 40 and 50 check for lack of power – ending a game, or if another input can be accepted at line 20.

Now you have the basic design of an adventure game you should have no problems expanding it or writing your own using the same techniques. It is possible to escape so captain your sub wisely, watch out for red herrings – and good luck.

```
10 DIM I$(9),F$(30),L$(30),P$(30),S$(3
0),U$(30),W$(30):? "↰":? :? :? "SUB ZE
RO ESCAPE!":C=1:D=0:H=0:P=1:S=0:T=25:W
=0:GOTO 40
20 INPUT I$:IF I$="S" THEN ? S$:D=0:P=
P+1:IF P>10 THEN P=1:W=T:C=C+1:H=INT(R
ND(0)*10)+1:? W$:T=0:IF W=20 THEN ? P$
:T=C*5:S=S+25
30 IF I$="U" THEN ? U$:T=T-1:D=D+1:IF
H>=P AND H<(P+2) AND D=C AND C<>4 THEN
 ? L$:T=20:IF P=H AND C>4 THEN ? F$:?
;S+50:END
40 F$="SUB SURFACES,WELL DONE!!!":U$="
SUB GOES UP INTO THE ICE":IF T=0 THEN
? "NO POWER LEFT,ALL HANDS LOST!":? ;S
:END
50 L$="A SHAFT OF LIGHT!":W$="A WHALE
BLOCKS THE EXIT":S$="SOUTH THROUGH AN
ICE CAVERN":P$="BUT YOU GET PAST!":? :
GOTO 20
```

**Get it right!**

```
10 MH9 (M)
20 DWR (T)
30 XW2 (M)
40 ADO (A)
50 M47 (4)
```

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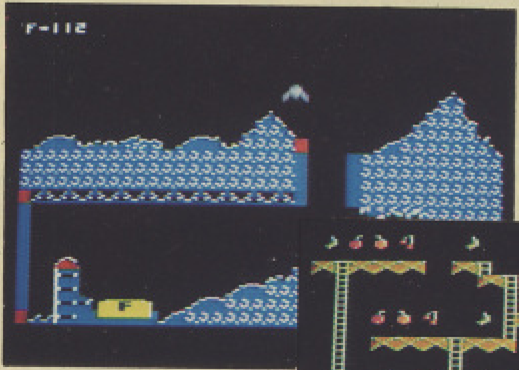
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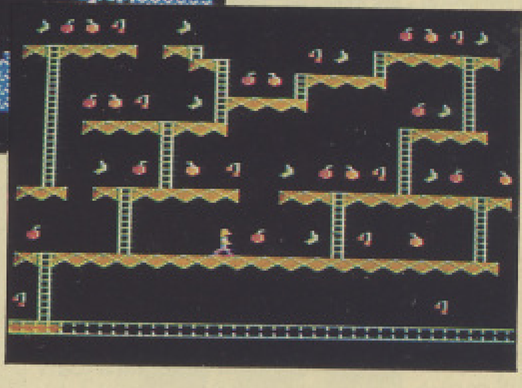
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# Your HINTS & TIPS

## The Price of Magik

WHEN you die enter RESTORE, then when the Lenslok screen appears get it wrong three times. The game will restart at the point where you died and you will have 251 stamina points and all your equipment.

You can do this every time you die, giving you infinite lives to allow you to complete most of the game easily. – **Daniel Welch, Rowley Regis, West Midlands.**

## Bounty Bob Strikes Back

When you have collected the flower pot on the first level, press number one on the keyboard. Now press Start and you will move to level four.

On level five if you collect the coffee pot and press eight followed by Start you will jump to level eight. – **William Donald, Turriff, Aberdeenshire.**

## Encounter

AS soon as you hear or see a missile flying towards you put your tank into full reverse and start firing. This is the best manoeuvre when trying to dodge it.

After completing a screen you have to go through the black hole. Look between the sights and, when you see an asteroid appear, move the joystick to one side and you should be able to avoid it without having to move around too much. – **Dorothy Bean, Middlesbrough, Cleveland.**

## Pole Position

SELECT track one, the eight-lap race and at the beginning of the game position your car in the centre of the track. This way no cars can hit you and you can sit back with the minimum of effort and watch the points accumulate until all the laps have been completed. – **Michael Hoar, Corsham, Wilts.**

## Quasimodo

HERE'S a cheat that will allow you to miss all the archers climbing the ladders.

After getting the first jewel on the second level run to the opposite end of the screen where the jewel cases are. Jump in the air and the jewel will automatically be placed in the first case for you.

What appears to be a ghost door will appear nearby – go through it and you will be transported to the next level. – **Michael Cain, Beeston, Nottingham.**

## Mercenary

AFTER getting the cheese – the fastest ship on Targ – go to the colony craft, then enter the kitchen and take the sink. It will allow you to pick up almost any object you find.

You can now pick up the spider's web which will act as a skeleton key and you will be able to open any door. Because of this you can drop the rest of your keys as you don't need them.

On the edge of the city you should see another ship flying around – go up to it and take it to get a lot more speed. If you wish to fly it you must go to a hangar, drop it, and board it. If you drop it anywhere else it will just fly away.

To be able to tell when you are near a mechanoid installation you must collect the metal detector at location 09-05: This will cause Benson's screen to change to blue when you are near an installation.

The metal detector will also let you know when you are over a Palyar building by glowing green – if it glows red, the building is not owned by anybody.

To avoid having your craft blown up when you are attacked on the ground, press L to leave it. You are shot but your craft is left intact. Finally, your escape craft is at location 3-15 and you have to use the elevators at location 9-05 to get to it – **Ruth James, Heaton Moor, Stockport.**

## Ghostbusters

WHEN you are just starting and the computer asks you if you have a bank account enter the following code without a name: 31222646. This will give you £999,900 in your account and you will be able to kit yourself out with all the best equipment. – **J. Speed, Beeston Rylands, Nottingham.**

## Beer Belly Burt's Brew Biz

ON certain screens look for walls next to the platforms: You can jump over them and out of the exits skipping several screens. – **Daniel Welch, Rowley Regis, West Midlands.**

## The Pay-off

HERE is a cheat for the adventure game that came free with most Atari disc systems.

Once the main program has loaded remove the disc from the drive. If you are killed during play you will be asked if you want to try again.

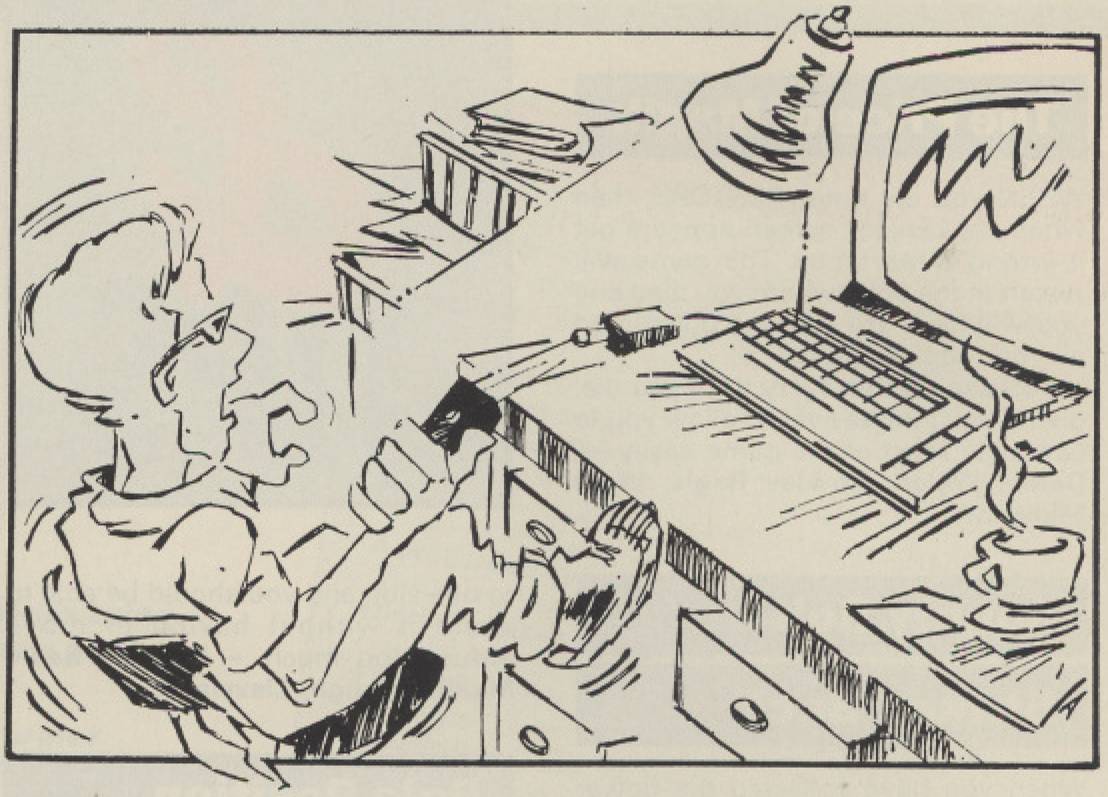
Entering Y will make the computer attempt to access the disc without success. Half the title screen will appear with the prompt What Now? and you have been returned to Luigi's betting shop.

To refresh the screen and remove the title, type E to move east. All the other game elements will remain unchanged: Objects will be in the same locations and condition they were left in from the previous game. – **R. Clarke, Solihull, West Midlands.**

## One on One

ON the inlay card for the tape version there is a mistake. It says that you should press 1 or 0 for a time-out. It should read: Press B for Bird or J for Dr.J. to obtain the time-out. – **Christopher Smith, Welling, Kent.**

**LEN GOLDING gives you the lazy approach to computing**



# The sound way to take things easy

**EVER since man first poked his enemy with a stick, the subject of remote control has fascinated the human mind. You can switch on your television or video, open your garage doors, lock your car, pilot model aircraft and do a host of other clever things without stirring from the spot.**

But this armchair revolution seems to have bypassed the computer world. So here's a gadget to start you on the right road – it's a simple remote control device which lets you send messages to your computer from a distance of up to six metres.

It can add an extra dimension to audio-visual displays in schools or staff-training centres, by allowing you to step through a preset sequence of stills or computer-animated drawings at the touch of a button, without any trailing wires.

It can also be used to trigger any of the power-control gadgets described in previous issues, so you could switch mains or battery-powered appliances on or off without going near them. It can even be made to operate as a stand-alone unit, to switch appliances on or off without the help of your computer.

We've chosen an ultrasonic system, for various reasons: It's cheaper and simpler than radio control, and beats infra-red on range, cost of operation and susceptibility to extraneous factors from the outside world.

There's also no risk that it will accidentally change channels on your IR-controlled television or activate your video. It uses a single on/off channel, but this is adequate for many purposes, as we'll explain later.

Figure I shows the transmitter. It's a simple oscillator which can be adjusted by VR1 to generate any frequency from around 35Khz to 45KHz, so it can be tuned precisely to the ultrasonic emitter's optimum frequency. Figure II shows the receiver, which is a little more complex in design.

TR1 and TR2 form a simple but powerful amplifier, which converts the tiny output from the ultrasonic transducer into a respectable voltage swing at the input of IC2. This IC is a phase-locked loop device, whose output goes low whenever a signal of the correct frequency is received.

It serves three purposes: First as an audio-to-digital converter, second as a current amplifier and third as a filter which rejects any spurious incoming frequencies.

Construction of both boards is easy, especially if you use the ready-made PCBs available from RH Design. Alternatively you may prefer to etch your own from the patterns at Figures IIIa and IIIb.

The transmitter board layout is

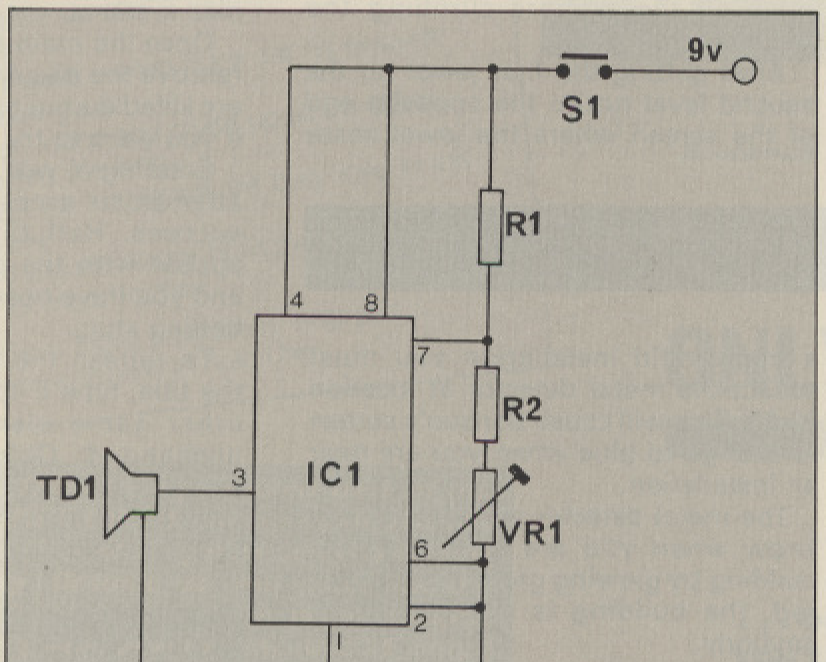



*Figure I: Circuit for transmitter*

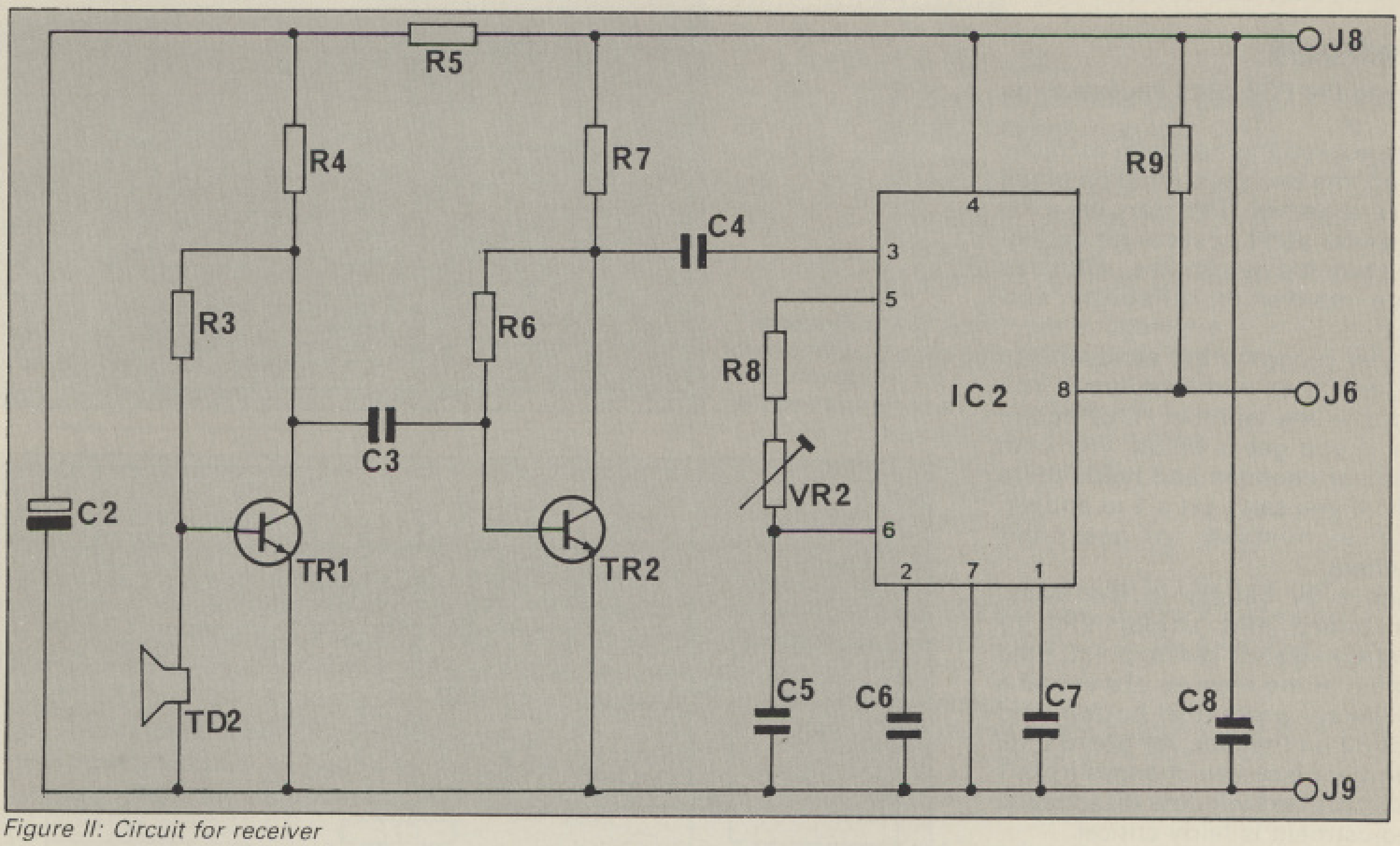



*Figure II: Circuit for receiver*

given in Figure IV. It's designed to fit into a small case supplied by Maplin Electronics, but could easily be adapted to suit other boxes if necessary.

The switch is a high-quality push-button type, which is sturdy enough to hold the entire board firmly in place, but we've included four mounting holes in case you want to use a different switch or box.

Make sure that IC1 is inserted with pin 1 in the correct position, but all the other transmitter components can go either way round. TD1 is the ultrasonic transmitter, and is marked with a T. You can attach it directly to a 2-way PCB terminal block as shown in Figure IV, by bending its leads slightly.

Alternatively, solder on longer leads allowing enough space to allow for adjustment of its position in the hand-held box. The battery leads must be soldered to veropins, or directly to their pads.

The receiver board layout is shown in Figure V. The only polarised components are TR1, TR2, IC2 and C2. The transistors will only fit one way round: IC2 has a small notch in one end, as shown in Figure V, and C2 has black chevrons to mark the 0v side. All other components can go either way round.

As with the transmitter board, the ultrasonic transducer TD2 can be wired to a two-way terminal block, or

**Turn to Page 50 ▶**

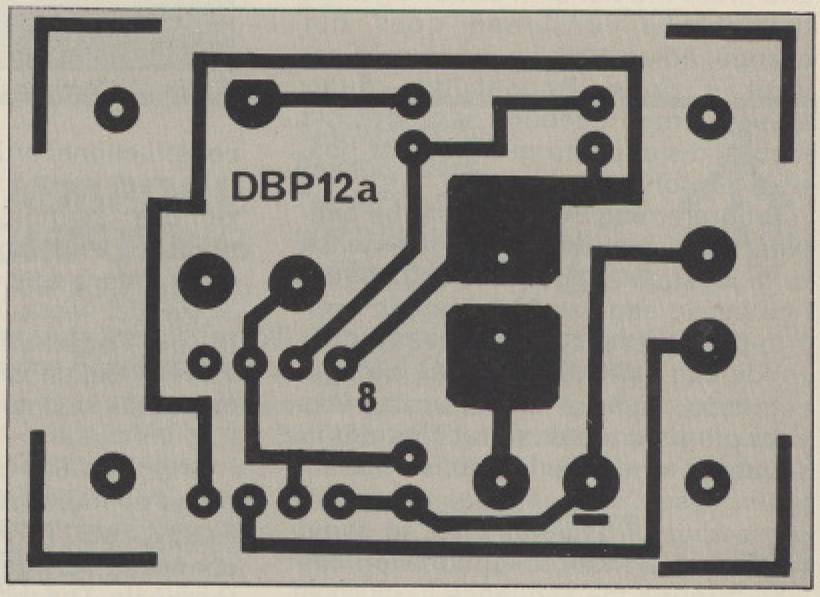



*Figure IIIa: The PCB transmitter pattern*

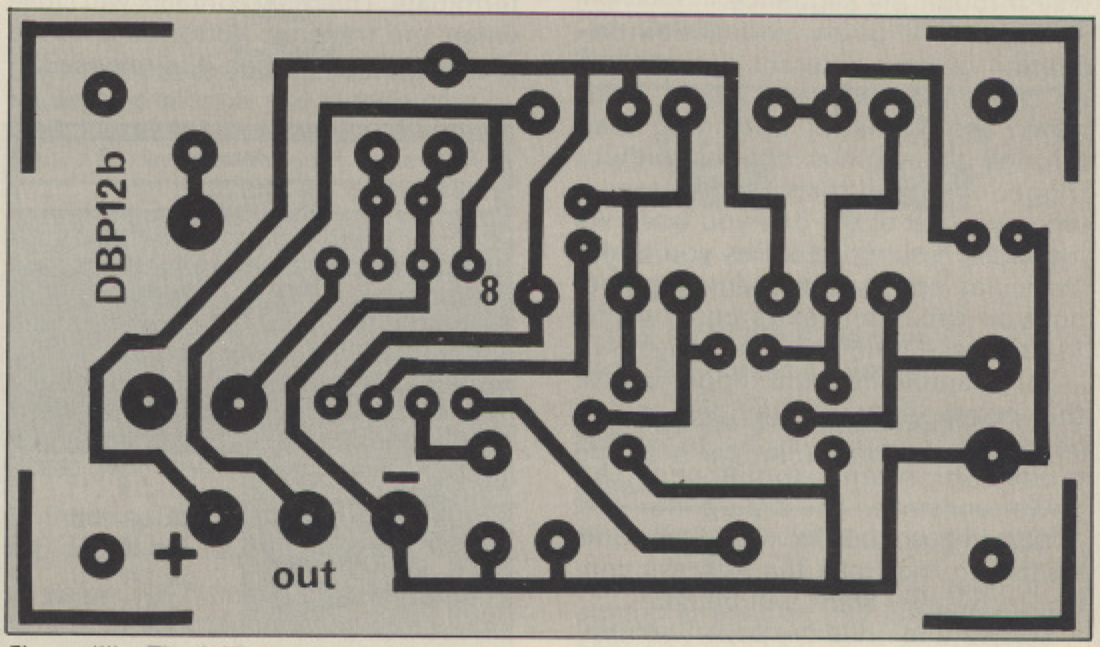



*Figure IIIb: The PCB receiver pattern*

◀ ***From Page 49***

directly to the PCB pads via extension leads.

When everything has been correctly soldered, the two units must be tuned to work together. This can be a bit fiddly if you don't possess an oscilloscope, but it's worth the effort to achieve maximum reliability and range.

Start by plugging the receiver into port 1, and then run Program I. You should see the number 1 at centre screen. If you get 0, adjust VR2 until the number changes and holds there reliably. If you can't get a 1 to appear, there's a mistake in assembly somewhere.

Attach a 9v battery to the transmitter board and adjust VR1 to somewhere near its centre point. Hold it pointing at the receiver about half a metre away, press the button and adjust VR2 on the receiver board until the number on screen changes from 1 to 0, and the text window disappears. This adjustment is fairly critical.

Now stand about two metres away and press the transmit button again. If the number onscreen does not change, adjust VR1 on the transmitter until it does. Repeat this dual-adjustment procedure at about six metres distance, to get the best possible response.

Programming could hardly be simpler. Your computer thinks the switch is a joystick trigger button, so the number in address 644 changes from 1 to 0 whenever the unit is activated.

You can use this to initiate a single action, or build a step counter into your program which selects options in sequence when the button is pressed. In this case it's a good idea to build in some kind of delay as well, to avoid triggering unwanted options on the way through the sequence.

Program II gives you a demonstration of how different options can be chosen quickly and easily. Hold down the Transmit button to step through the various options without triggering any of them, and release it when you get to the one you want. As it stands, it simply notifies you that a particular option has been triggered, but you can insert extra code at line 110 to make it do something useful!

For example, it could trigger one of the power-control devices we've described in earlier issues, to control models or mains appliances. The power controller could plug into port 1, leaving port 2 for the ultrasonic switch. In this case the address controlled by the switch will be 645.

Software to drive the power controllers themselves is described in the constructional articles for each device.

If you would prefer to use the remote switch as a standalone module, independent of your computer, attach a 6v or 9v battery in place of joystick leads 7 and 8 – positive to the pin 7 point – and replace R9 with a 1N4148 signal diode, wired with its cathode – coloured band – towards IC2.

Choose a 6v relay whose coil is 80 ohms or more, such as Maplin types FX88V, FM91Y, FM89W or FX23A, and connect it between the pin 7 and pin 6 terminals. The relay contacts will close when the transmit button is pressed and open again when it is released.

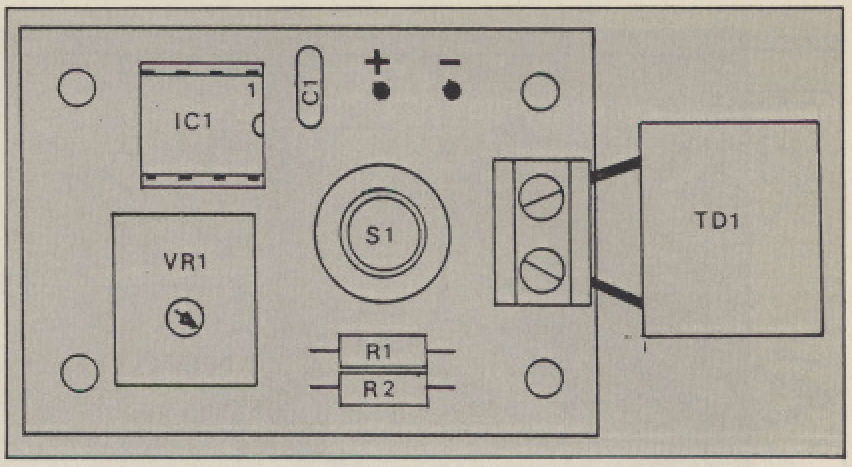



*Figure IV: Component layout for transmitter*

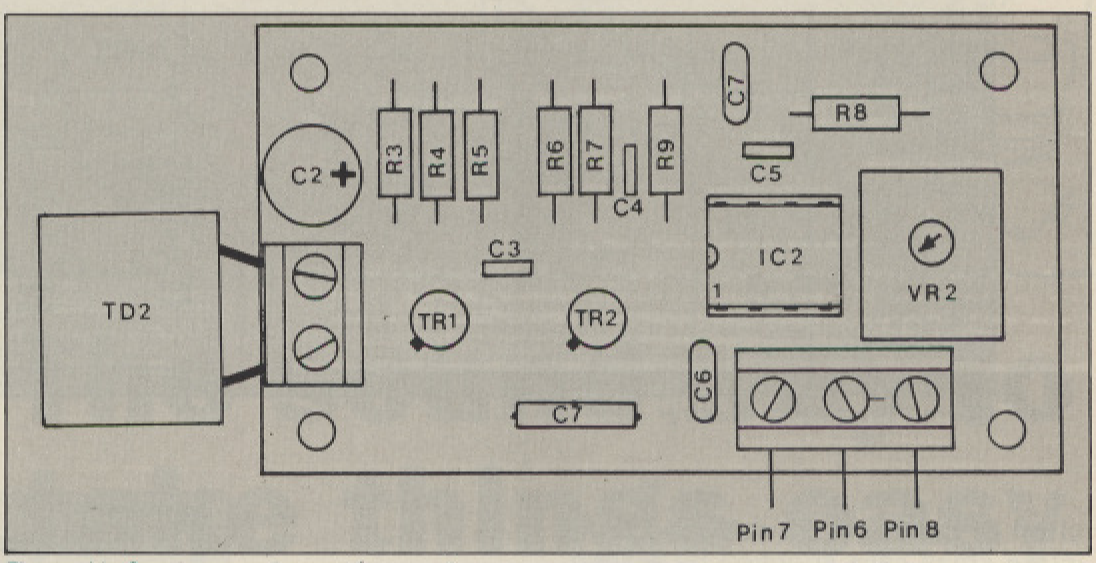



*Figure V: Component layout for receiver*

*Program I: Program to help set up the switch*

```
5 REM PROGRAM 1: Setting-up the ultras
onic switch
10 GRAPHICS 2
20 POSITION 9,4:? #6;PEEK(644)
30 POKE 710,PEEK(644)*8
40 GOTO 20
```

Get it right!

```
 5 CAN (S)
10 UWK (N)
20 LC3 (O)
30 6A0 (3)
40 KKK (F)
```

*Program II: Demonstration of switch selecting different options*

```
5 REM PROGRAM 2: Using the switch to s
elect from a range of options
10 COUNT=0:GRAPHICS 1
20 POSITION 0,2:FOR LINE=1 TO 16:? #6;
"OPTION ";LINE:NEXT LINE
30 POKE 752,1:REM Turn the cursor off
40 ? "Press the Transmit button to ste
p":? "through the options. Release it
to":? "activate the one you want."
50 IF PEEK(644)=1 THEN 50:REM Wait for
 ultrasonic signal
60 POSITION 9,COUNT+1:? #6;"  ":REM Tw
o spaces:REM Erase old arrow
70 COUNT=COUNT+1:IF COUNT>16 THEN COUN
T=1:REM Step to next option
80 POSITION 9,COUNT+1:? #6;CHR$(60);CH
R$(60)
90 FOR W=1 TO 150:NEXT W:REM Sets step
 speed
100 IF PEEK(644)=0 THEN 60:REM If sign
al still present, do not activate this
 option
110 ? CHR$(125):? "OPTION ";COUNT;" AC
TIVATED":REM Insert your own code here
120 GOTO 50
```

Get it right!

```
  5 CAN (S)    70 S7L (E)
 10 A1Q (9)    80 PDJ (F)
 20 UXT (U)    90 R8T (6)
 30 SJR (D)   100 P6U (Y)
 40 QMJ (S)   110 92C (V)
 50 Q9E (C)   120 P57 (C)
 60 5JG (W)
```

## PARTS REQUIRED FOR ULTRASONIC SWITCH

### TRANSMITTER

| | | Maplin Code |
|---|---|---|
| R1 | 1k (brown/black/red) | M1K |
| R2 | 12k (brown/red/orange) | M12K |
| VR1 | 4K7 horizontal preset | UH02C |
| C1 | .001 mfd Mylar (marked 102k) | WW15R |
| S1 | Push-to-make switch | YR67X |
| IC1 | TLC555C | RA76H |
| TD1 | Ultrasonic transmitter * | |
| | PP3 battery lead | HF28F |
| | PP3S battery | FK62S |
| | 8-pin DIL socket | BL17T |
| | Small narrow box (optional) | FT31J |

### RECEIVER

| | | |
|---|---|---|
| R3, R6 | 1M (brown/black/green) | B1M |
| R4 | 47k (yellow/violet/orange) | M47K |
| R5 | 1k (brown/black/red) | M1K |
| R7 | 10k (brown/black/orange) | M10K |
| R8 | 18k (brown/grey/orange) | M18K |
| R9 | 4K7 (yellow/violet/red) | M4K7 |
| VR2 | 10k horizontal preset | UH03D |
| C2 | 100mfd 10v single-ended | FF10L |
| C3 | 3n3 ceramic | WX74R |
| C4 | 22n ceramic | WX78K |
| C5 | 1n0 ceramic | WX68Y |
| C6 | 0.1mfd disc ceramic | YR75S |

| | | Code Maplin |
|---|---|---|
| C7 | 0.22mfd Mylar (marked 224k) | WW83E |
| C8 | 0.01mfd Mylar (marked 103k) | WW18U |
| TR1,TR2 | BC109C | QB33L |
| IC2 | NE567 tone decoder | QH69A |
| TD2 | Ultrasonic receiver * | |
| | 3-way PCB terminal | RK72P |
| | 2-way PCB terminal (optional) | FT38R |

** Note: The ultrasonic transducers are sold as a pair, order code HY12N.*

All components are available from:
Maplin Electronic Supplies,
P.O. Box 3, Rayleigh,
Essex SS6 8LR.
Tel: 0702 552911

Printed circuit boards (order code DBP12a and DBP12b) Price £2.38 per pair. Joystick extension lead (order code AT111) Price £2.99 Available from:
R.H. Design,
37 Stonefall Avenue, Harrogate,
North Yorkshire, HG2 7NS.
Tel: 0423 508359

*Prices include VAT and postage*

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● Atari 800 16k ram, 10k rom, 48k ram expansion boards also keyboard and connector strap for Atari 800 £50. Tel: 0272 661842 after 6pm.

● Citizen 120D NLQ Epson compatible printer £130. Atari assembler editor cartridge £12. Atari macro assembler disc £10. All with manuals. Tel: 0268 743725.

● 1050 disc drive, XC12 cassette, various software, (all new) offers? Tel: Northwood Middx 25671.

● Atari 130xe computer 1029 printer, 1050 disc drive, XC12 recorder and joystick. Also Mini Office and The Pawn all in brand new condition and boxed £350. No offers. Tel: 01 302 0589.

● 130xe + disc drive + XC11, mags, games, atari artist touch tablet, manuals, discs £240. Tel: Southend-on-Sea 62596.

● 1050 drive £100, 1027 printer £80, 1020 plotter + T.tablet + extra pens, paper, software £100. Atari XMM801 Epson - compatible dot-matrix printer £160. Gauntlet, Ballyhoo, Mini Office £10 each. Tel: Bristol 0272 623637.

● For sale Atari 130xe, 1010 recorder, 1050 disc drive, 1027 printer, joysticks all boxed, magazines and atari-writer, Mini Office II + software £299. Tel: Ross 01 642 1352.

● Atari 130xe, 1050 disc drive with "lazer# enhancement. Some software £120. Buyer collects. Tel: Brentwood 216112.

● 130xe, 1010, 1050 drive, 60+ original titles, disc box, mags, two joysticks, blank discs worth over £800 will sell for £220. Tel: 0608 737332.

● Atari touch tablet and software £20. Plus original disc and cassette software from 75p to £9.50. Tel: 0702 510487.

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# SOFTWARE *Solutions*

## Your programming problems solved by ANDRÉ WILLEY

**LET'S start with an easy query from Mr K.L. Edwards from Warden Hill, Cheltenham, who writes:**

*I'm in the middle of designing a large database program on my 130XE, but I've found a problem:*

*When someone runs the program he can enter almost unlimited information because the text is stored in a very long string. This is initialised by the following code:*

```
100 DIM D$(13000)
110 FOR Z=1 TO 13000: D$(Z,
Z)=" ": NEXT Z
```

*But line 110 takes about two minutes to execute, so please could you give me an alternative method – possibly by programming it in machine code for me.*

Using machine code in this case would be rather like using a sledgehammer to crack a nut. In fact, Basic's own string handling functions have a rather convenient little side effect which will solve your problem much more easily. We have touched briefly on this technique before, but it's so useful that it could do with more explanation.

When copying between two strings using a statement like LET A\$=B\$, Basic simply takes the first character from *B\$* and places it in the first position of *A\$*, and then repeats the process for the second, third, fourth and so on until the whole string is copied.

Alternatively, it is quite possible to copy the new string anywhere inside the original using the normal substring notation. For example, to copy *B\$* in at position two of *A\$* you would use A\$(2)=B\$.

If you pause to think what's happening here you will see the answer to your query is just around the corner. Character one from *B\$* is copied in to position two of *A\$*, then *B\$(2)* is copied to *A\$(3)*, *B\$(3)* to *A\$(4)* and so on until all *B\$* has been copied.

The sneaky trick comes when you try copying a string into itself in this manner – using A\$(2)=A\$. Firstly character one from *A\$* is copied to position two. Next character two – which we have just transferred from position one – is copied to position three. This new character at position three is copied to four, and so on until the end of the string.

The end effect is that character one is copied to position two, then three, then four and so on until the whole string is filled with the first character – rather like toppling a line of dominoes.

So, in your example, try the following:

```
100 DIM D$(13000)
110 D$(1)=" "
120 D$(13000)=" "
130 D$(2)=D$
```

Don't forget to set up the length of the string by writing to the very last character as shown in line 120, otherwise the string copy will stop as soon as it thinks there's no more text giving only a copy of a single character.

So there you have it – a very simple and rather elegant method of filling a string with anything you want instantly.

## Type-in trouble

Now a letter from **Steven Taylor** from Essex who seems to be having some difficulty with one of our longer programs:

*I have an 800XL with a 1050 disc drive, and have been buying* Atari User *from the very first issue. I quite often key in the listings, but I've been having a little difficulty with Chopper Rescue from the September 1987 issue.*

*I had been typing for some time and had almost finished when I got an Error 4 as I tried to enter line 6720. My book says that this means* Too many variables (greater than 128)*, but I've counted and there seem to be far less.*

*Is this due to a fault in my machine, or does the game needs more than 64k to run? I assume that it does work correctly with the 800XL.*

Although the solution to your problem is straightforward, the cause is rather more complex. First of all let's discount some of the possibilities.

There is no fault in the game, and it should run quite happily on a 64K 800XL. Also, there are not more than 128 variables in the program – so why does the error occur?

The answer lies in the way in which Atari Basic functions, using a system known as tokenisation. All this means is that after you've typed in each line, Basic converts all that long-winded text into a much shorter set of symbols.

For example, when you type REM, Basic will store it as a single Ascii byte zero. Similarly, DATA would give a value of one, INPUT two, COLOR three, and so on.

Another way in which it packs your program in into a smaller space is by using a similar technique with variable names. You may find variables with names such as MYDISPLAYLIST and CUSTOMERSTOCKCODE useful, but they waste an enormous amount of memory. Just think, if you used them each 20 times in your program you'd have just wasted half a kilobyte of ram. It is obviously far more convenient and compact for Basic to store the name just once, and use another one-byte token whenever it needs to refer to it.

Each time you type in a new variable name as you key a program in, the computer will set up an entry in a special table – called the variable name table – and the tokenised line will just contain a reference number. This whole table is always stored with the program when you save it and, in fact, there are only two ways to remove it –

**Turn to Page 54 ▶**

◀ **From Page 53**

load a new program or type NEW.

I assume you must have been working on another listing before you started typing in Chopper Rescue, so leaving all the variable references from that previous program were left in memory. When you started working on Chopper Rescue you simply added your new variables to the end of the table, and eventually filled it up to the maximum of 128 entries.

The solution is simple: Firstly you should list the program to disc using:

```
LIST "D:TEMPFILE"
```

Then type NEW to erase both the program and the variable name table from memory, leaving a clean slate ready to accept the correct table. Now all you need do is use:

```
ENTER "D:TEMPFILE"
```

The program will be read back in, line by line, and a new table created just as though you were typing the lines in from the keyboard. This tokenising process is usually very fast – you certainly wouldn't notice it when typing in a single line from the keyboard – but you will find that ENTER is very much slower than LOAD due to the extra time taken by this routine.

You might like to take a look at the token table for yourself so I've written a small program which will display the current contents of the variable name table, plus the rom-based statement and function tables. In case you want to delve further, the ram-based tables start straight after Dos and there are a set of zero page pointers to keep track of them.

The variable name table we have been discussing is pointed to by locations 130 and 131 (in normal 6502 low-high format). The end is indicated by locations 132 and 133 but, since there is normally a null byte (zero) at the end, the program doesn't test for the end address.

Locations 134 and 135 point to the variable value table. This contains eight-byte values for each variable defined in the name table, and it is these entries which determine the type of variable (numeric, string or array).

Locations 136 and 137 point to the statement table – the tokenised version of the program itself. Locations

# SOFTWARE *Solutions*

138 and 139 indicate the last entry in this table, and it is here that your immediate mode commands are stored until Basic has finished processing them.

After the program space comes an area reserved for the contents of strings and arrays (pointed to by 140 and 141), and finally locations 142 and 143 point to Basic's internal stack which keeps track of GOSUBs and FOR ... NEXT loops.

```
10 VER=PEEK(43234)
20 IF VER=162 THEN STATTAB=42159:OPTAB
=42979:REM REV A BASIC
30 IF VER=234 OR VER=96 THEN STATTAB=4
2143:OPTAB=42974:REM REV B/C BASIC
40 IF OPTAB=0 THEN ? "ERROR: NOT REV A
, B OR C BASIC":END
100 GRAPHICS 0
110 ? "VARIABLE NAME TABLE":?
120 ADDR=PEEK(130)+PEEK(131)*256
130 BASE=128:OFFSET=0
140 GOSUB 1000
200 ? :? :? :? "STATEMENT TOKEN TABLE"
:?
210 ADDR=STATTAB
220 BASE=0:OFFSET=2
230 GOSUB 1000
300 ? :? :? :? "OPERATOR TOKEN TABLE":
?
310 ADDR=OPTAB
320 BASE=16:OFFSET=0
330 GOSUB 1000
400 END
1000 REM PRINT TABLE CONTENTS
1010 NUM=BASE:? "TOKEN","CONTENTS":?
1020 ADDR=ADDR+OFFSET
1030 IF PEEK(ADDR)=0 THEN RETURN
1040 PRINT NUM,:NUM=NUM+1
1050 IF PEEK(ADDR)>127 THEN 1070
1060 PRINT CHR$(PEEK(ADDR));:ADDR=ADDR
+1:GOTO 1050
1070 PRINT CHR$(PEEK(ADDR)-128):ADDR=A
DDR+1:GOTO 1020
```

## Speedier sort

Finally this month a letter from **G. Yearwood** of Lincoln who writes:

❛ *Having had my Atari 130XE for a few months, I have progressed to the stage where I'm trying to write programs of my own.*

*I have written a database program of names and address of just about everyone I know and it seems to work fine apart from one snag: Any amendments or additions to the information will initiate a sorting of the surnames, and here lies the problem – it takes ages!*

*Is there a machine code routine for string sorting that I could use to speed things up?* ❜

This is another problem where machine code is not the best solution, and a little bit of lateral thinking will let you do the job much more elegantly in Basic. What you really need to do is redefine the problem.

You have a sorted list of names and addresses, in surname order. When adding a new entry to this you are at present adding it to the end of the list and then re-sorting the whole thing to get it back into order. But wait a moment – there's only one entry out of sequence here, so isn't it rather a waste of time re-sorting the whole lot?

Instead, why not simply put the new entry in the correct position in the first place? If you do this every time a new record is added, the list will always remain in sequence and you'll never have to do a sort again.

Each time you want to add a new item to your list, search through until you find the entry just after the position you want to place your new entry. Then move the rest of the text up in memory to make room for it and just drop it in to place.

For example, if you wanted to add the name Smith to a list such as Davidson, Jones, Morgan, Taylor and Willey you would select the next entry (Taylor) and move it up one place together with all the following entries. Then you just fill the gap with Smith.

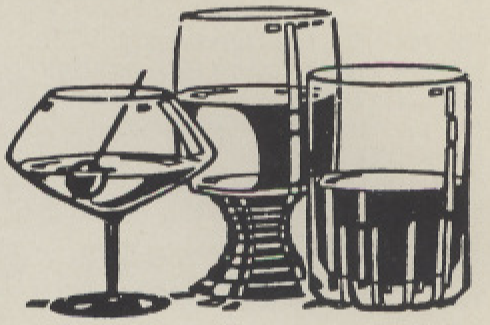
You will already be familiar with the commands used to modify portions of strings and to compare them, so all you need to know is how to make that extra space. Once again, Basic's string handler comes to the rescue.

Take as an example *TXT$*, which contains a number of 50 character sub-strings which make up your entries. If you want to make space for an extra one at position 201 you would use:

```
TXT$(201+50)=TXT$(201)
```

That's it for this month, but don't forget that solving problems with a computer is often a lot easier if you can step back a couple of paces and think of an alternative way of asking the question. You might find that the answer is a lot simpler than it first looked.

# PICKLING PROGRAM



**RUTH JAMES brings a bleary eye to the festivities**

**COCKTAILS are always popular, especially at this time of year, so here is a program to help you create new and exciting drinks. Well, to be perfectly honest, some of the creations sound awful, but then, you never know until you try.**

In the world of the cocktail bar, the rule is that almost anything goes, so this program is not terribly reticent about what it mixes.

Every cocktail must have its own name, so lines 1000 to 1160 design one on a modified random basis. The process is open-ended so it can generate extremely long names on occasions. However, they should all be pronounceable – at least before trying the drink.

And endless party fun can be had attempting to say the name after having imbibed.

The program classifies drinks according to type, for example spirits, liqueurs, fortified wines and soft drinks. The recipe for the cocktail is generated by choosing a random number of items – maybe zero – from each category.

Some drinks should never be mixed and these are separated into groups in the spirit and liqueur sections. The program will only match group A and B spirits and liqueurs, never drinks from the same group. Basically group A spirits are grain-based and group B grape-based. Similarly group A liqueurs are generally fruit-based with group B herb-based.

The data statements defining the available ingredients can be modified to remove anything you disapprove of, or to add your own particular favourites. All sections begin with a number which tells the program how many items are in the group. Therefore all you need to do is add or remove items from the data statements in the appropriate section and change the number at the start of the block.

That's enough theory, happy mixing.

*WARNING: It ish an offensh, under the 1876 Home Compu(hic)ter Act, to operate a compu(hic)ter while under the influensh of this prog...*

**How to make a Quagozade**

1 Measure of Kirsh
1 Measure of Sloe Gin
1 Measure of Sweet Sherry
1 Measure of Apricot Juice
2 Measures of Pepsi

and some apple slices

**How to make a Kemeju**

3 Measures of Whisky
1 Measure of Sweet Vermouth
3 Measures of Red Wine
1 Measure of Apricot Juice
1 Measure of Pepsi

and some fresh pineapple cubes
and some lime peel
and some dried apricots

**How to make a Tirebelu**

2 Measures of Kirsh
2 Measures of Madeira
2 Measures of Pineapple Juice
1 Measure of Lemon Juice

and some raisins
and some ice cubes
and some fresh pineapple cubes

**How to make a Poquaguaqua**

1 Measure of Schnappsa
2 Measures of Slow Gin
3 Measures of White Wine
3 Measures of Pear Juice

and some apple slices

```
1 REM THE PAN-GALACTIC COCKTAIL BAR
2 REM BY RUTH JAMES
3 REM (c)ATARI USER
5 GOSUB 500
10 ? CHR$(125)
15 POSITION 5,0:? "THE PAN-GALACTIC CO
CKTAIL BAR":POSITION 5,1:? "----------
-------------------"
17 POSITION 5,2:? "By Ruth James"
20 POSITION 5,6:? "How to make a ";
30 GOSUB 1000
35 ? :?
40 V=INT(RND(0)*2)=1
50 IF V=1 THEN LIN=3000:GOSUB 300:LIN=
4000:GOSUB 300
60 IF V<>1 THEN LIN=2000:GOSUB 300:LIN
=5000:GOSUB 300
70 LIN=6000:GOSUB 300
80 LIN=7000:GOSUB 300
90 LIN=8000:GOSUB 300
100 ? :LIN=9000:GOSUB 300
110 POSITION 4,20:? "PRESS ANY KEY FOR
 ANOTHER DRINK"
120 OPEN #1,4,0,"K:"
130 GET #1,KEY:IF KEY<>0 THEN RUN
140 GOTO 130
300 REM INGREDIENTS
305 RESTORE LIN
310 READ N
320 N=INT(RND(0)*N)+1
330 FOR I=1 TO N
340 READ ING$
350 NEXT I
360 T=INT(RND(0)*4)
370 IF T=0 THEN RETURN
380 IF LIN=9000 THEN ? "   and some ";
:GOTO 410
390 ? "   ";T;" Measure";
400 IF T>1 THEN ? "s";
405 PRINT " of ";
410 ? ING$
420 IF INT(RND(0)*100)<10 THEN 305
430 RETURN
500 REM INITIALISE
```

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```
505 POKE 752,1:SETCOLOR 2,0,0
510 DIM VOW$(5),CONST$(21),ING$(20)
520 VOW$="AEIOU"
530 CONST$="BCDFGHJKLMPQRSTVWXYZ"
540 RETURN
1000 REM SELECT NAME
1010 R=INT(RND(0)*20)+1
1020 ? CONST$(R,R);
1030 IF R=12 THEN ? "U";
1040 IF R=15 THEN IF INT(RND(0)*5)=1 T
HEN ? "H";
1050 R=INT(RND(0)*5)+1
1060 ? VOW$(R,R);
1070 R=INT(RND(0)*20+1)
1080 ? CONST$(R,R);
1090 IF INT(RND(0)*15)=1 THEN ? CONST$
(R,R);
1100 IF R=12 THEN ? "U";
1110 IF R=1 THEN IF INT(RND(0)*20)=1 T
HEN ? "B";
1120 IF R=2 THEN IF INT(RND(0)*2)=1 TH
EN ? "K";
1130 IF R=15 THEN IF INT(RND(0)*9)=1 T
HEN ? "H";
1140 IF R<>12 THEN IF INT(RND(0)*10)=1
 THEN ? "R";
1150 IF INT(RND(0)*5)<2 THEN 1050
1160 RETURN
2000 REM SPIRITS GROUP A
2010 DATA 8,Gin,Whisky,Vodka,Kirsh,Sak
i,White rum,Tequila,Schnapps
3000 REM SPIRITS GROUP B
3010 DATA 4,Brandy,Dark rum,White rum,
Armagnac
4000 REM LIQUEURS GROUP A
4010 DATA 21,Apricot brandy,Peach bran
dy,Advocaat,Abricotine,Blackberry liqu
eur,Cassis,Moka,Cherry brandy
4020 DATA Cointreau,Creme d'Ananas,Cre
me de Cassis,Creme de Fraise,Creme de
Mandarine,Creme de Noyau,Curacao
4030 DATA Drambuie,Framboise,Glayva,Gr
and Marnier,Maraschino,Van der Hum
5000 REM LIQUEURS GROUP B
5010 DATA 9,Sweet vermouth,Dry vermout
h,Strega,Sloe gin,Millefiori,Creme de
Menth,Yellow Chartreuse,Campari
5020 DATA Green Chartreuse
6000 REM WINES AND FORTIFIED WINES
6010 DATA 9,White wine,Red wine,Rose w
ine,Cider,Port,Sweet sherry,Dry sherry
,Medium sherry,Madeira
7000 REM SOFT DRINKS
7010 DATA 9,Lemon juice,Apple juice,Pi
neapple juice,Tomato juice,Apricot jui
ce,Orange juice,Mixed fruit juice
7020 DATA Lime Juice,Pear Juice
8000 REM FIZZY DRINKS
8010 DATA 8,Coke,Pepsi,7 Up,Lemonade,B
itter Lemon,Tonic water,Ginger ale,Sod
a water
9000 REM FLOATERS
9010 DATA 13,orange peel,ice cubes,clo
ves,lemon peel,lime peel,cherries,crus
hed ice,apple slices,raisins
9020 DATA dried apricots,dried peaches
,fresh pineapple cubes,orange slices
```

**Get it right!**

| LINE | CHSUM | LINE | CHSUM | LINE | CHSUM |
|---|---|---|---|---|---|
| 1 | CAJ (W) | 350 | P33 (P) | 1110 | JXG (H) |
| 2 | CAK (3) | 360 | 4EC (L) | 1120 | PAX (K) |
| 3 | CAL (V) | 370 | D7T (N) | 1130 | GLK (W) |
| 5 | P9A (P) | 380 | 30X (9) | 1140 | VJX (8) |
| 10 | P99 (E) | 390 | H5C (R) | 1150 | TT8 (S) |
| 15 | 6U0 (N) | 400 | 3MJ (L) | 1160 | VTK (W) |
| 17 | XF3 (X) | 405 | PNQ (A) | 2000 | CXP (R) |
| 20 | 2C3 (J) | 410 | HEC (H) | 2010 | 9PQ (N) |
| 30 | ROL (M) | 420 | W8W (U) | 3000 | CXQ (J) |
| 35 | CVY (W) | 430 | RK8 (Q) | 3010 | JS0 (1) |
| 40 | 9RX (W) | 500 | CUW (W) | 4000 | CXR (2) |
| 50 | 73R (T) | 505 | QYH (U) | 4010 | MGA (K) |
| 60 | 1MF (U) | 510 | 61E (P) | 4020 | 8QF (W) |
| 70 | 337 (T) | 520 | SCF (L) | 4030 | LNT (7) |
| 80 | 33A (P) | 530 | Y8H (W) | 5000 | CXS (5) |
| 90 | 33E (5) | 540 | RP9 (L) | 5010 | 8XS (T) |
| 100 | GW1 (J) | 1000 | CXN (N) | 5020 | 1SP (J) |
| 110 | KNJ (K) | 1010 | 8UA (U) | 6000 | CXT (H) |
| 120 | 4XC (2) | 1020 | 7QH (9) | 6010 | 3R8 (E) |
| 130 | X5V (R) | 1030 | 4H1 (N) | 7000 | CXU (E) |
| 140 | QL7 (8) | 1040 | GJF (Q) | 7010 | FAN (7) |
| 300 | CUU (4) | 1050 | 8XP (F) | 7020 | 2N9 (E) |
| 305 | XCX (8) | 1060 | VQS (Q) | 8000 | CXV (2) |
| 310 | P57 (F) | 1070 | 98T (8) | 8010 | OXV (T) |
| 320 | 95U (3) | 1080 | 83H (R) | 9000 | XW (M) |
| 330 | TGH (A) | 1090 | XUQ (R) | 9010 | MVA (7) |
| 340 | WK7 (M) | 1100 | 4F1 (4) | 9020 | USU (W) |

# Making the most of Mini Office II

*WHILE playing around with Dos 2.5 the other day I got the directory of my Mini Office II disc on screen. I found that any of the modules can be loaded using the binary load feature of Dos – that is option L, followed by the filename of the module you wish to load.*

*Also when using the word processor, if you type Return – but not a marked Return, which would show up as a bent arrow character – then backspace with the cursor and type Control+inverse video key, the Escape (27th) character will appear.*

*This is very useful for printer codes, especially if you have run out of macros. This enables you to switch between fonts, pitches or new character sets without having to resort to using macros, which is very useful for anybody who wants to re-define the printer set, but doesn't have enough room to do so in the macro menu.*

*On a different topic, when using Dos 2.5 and you wish to view a text file without having to go into the word processor, select option C from Dos and type: FILENAME.EXT,E: to display the file to screen, or: FILENAME.EXT,P: to print the file out.*

*If the text is scrolling too fast use Control+1 to stop or start it. When printed out the file is of a poor format, so its only use is if you want to quickly check a document before creating a final copy.* – **Jonathon Burg, London.**

## WP with a recorder

*COULD you pease inform me if there are any word processors available for use with a data recorder?* – **Marcus McCollum, Balymoney, Co. Antrim, N.Ireland.**

● The AtariWriter cartridge will work with a cassette deck. When a file is saved long inter-record gaps are used and this this unfortunately slows the proceedings down – but it does work perfectly well.

## Software compatability

*I HAVE been reading Atari User for five months and I find it excellent. But I have some questions: Is 8 bit software compatible with the 16 bit ST? And how can you get the Atari to take in a letter or number without you having to press Return?* – **Simon Lewis, Lee, London.**

● No the software written for the 8 bit Atari micros is not compatible with the ST. The latter uses a Motorola 68000 CPU while the 8 bit Atari uses a 6502C microprocessor.

The way to get the Atari to take a number from the keyboard without having to press Return is to use the OPEN and GET commands.

The simplest way to explain this is to give you a example program:

```
10 OPEN #1,4,0,"K:"
20 GET #1,KEY
30 IF KEY=32 THEN 50
40 GOTO 20
50 ?"YOU PRESSED THE SPACEBAR"
```

Line 10 tells the computer to look for an input from the keyboard. The K: in the OPEN command tells the computer to look at the keyboard, and the 4 indicates an INPUT operation.

The GET#1,KEY command on line 20 takes this input and assigns the Ascii value to *KEY* which is just a variable name and can be anything you want.

Line 30 checks to see if the key pressed is the spacebar and if it is goes to line 50. Line 40 simply puts the computer into a loop waiting for the spacebar to be pressed. Line 50 simply prints a message indicating you hit the spacebar.

## Waiting for new drive

*I RECENTLY ordered a 1050 disc drive from Compumart, but I received a letter saying that Atari have withdrawn it. They also said that a new disc drive made by Atari will be released around September.*

*Could you please tell me the differences between it and the old 1050 and will software be compatible? Also, when exactly will it appear?* – **A Pyrski, Slough, Berks.**

● The Atari 1050 disc drive has been withdrawn so it can be replaced with the XF-551 drive. This was expected to be released before Christmas, but Atari is experiencing difficulties so the release date will probably be around January.

The main difference between the two drives is that where the 1050 required a modification to give double density and faster loading speed, the XF-551 has true double density and high-speed load built in. Atari guarantees the drive will retain full compatability with all existing software.

## WIN A TENNER!

**EACH month we will award £10 prizes for the most interesting letters sent to us.**

**So now there's more reason than ever to contribute to our lively mailbag pages.**

**Get your pens out, start writing and you could be one of the winners. The address:**

**Mailbag Editor**
**Atari User**
**Europa House**
**Adlington Park**
**Adlington**
**Macclesfield SK10 5NP**

## Help in business

*THREE years ago I bought an Atari 800XL with Atari 1050 disc drive but never used them. Last year, after being made redundant, I started my own taxi and private hire business which has proved successful.*

*I now wonder if it is possible for me to use the computer in my business with*

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*regard to my personal taxation, business accounts and business writing using a word processor.*

*I realise that if such programs are available I would also require a printer and your suggestions would be appreciated.* – **G. Hallas, Blackpoool, Lancs.**

● An ideal product for you to buy to help you with your business is Mini Office II. It is disc based and gives you a word processor, spreadsheet, database, label printer, graphics package and communications program for only £19.99.

It is designed to work with an Atari 1029 or Epson-compatible printer. The 1029 will plug straight into the serial port on your 800XL, but other printers need an Atari 850 interface box or some other suitable printer interface before you can use them.

There is a review of the Panasonic KX-P1081 – an Epson compatible printer – in the October 1987 issue of Atari user.

# ATARI USER Mailbag

WE welcome letters from readers – about your experiences using the Atari micros, about tips you would like to pass on to other users . . . and about what you would like to see in future issues.

The address to write to is:

**Mailbag Editor**
**Atari User**
**Europa House**
**Adlington Park**
**Adlington**
**Macclesfield SK10 5NP**

## Booting with Basic

*I OWN an Atari 800XL and have an annual subscription for* Atari User. *I typed in Get It Right II! from the November issue, checked it with the old Get It Right! and saved it on cassette as instructed in the magazine.*

*When loaded into memory I get on screen the message Get It Right II (in a box) and Loaded OK (not in a box) but I do not get the message Ready. Instead it goes straight to the Self Test routine.*

*Can you explain why the Ready message is not coming up on my screen.* – **Maureen Seymour, Ayrshire, Scotland.**

● You will find your problem lies with the procedure you are using to load the new autoboot file into memory. If you hold the Option and the Start keys when booting the program, you will switch off Basic.

When the GIR program attempts to go to Basic after loading it won't be able to, so it will go into self test. You only have to hold the Start key down to boot with Basic.

## Switching Dos formats

*Is there a utility available that will allow me to convert Dos 3 files to a Dos 2.5 format?* – **James Harvey, Hammersmith, London.**

● The Dos 2.5 master disc contains a file called COPY32.COM which will allow you to do this. You'll also have the enhanced density available and retain full compatibility with Dos 2.

## Auto line numbering

*I HAVE recently bought an 800XL and I am still learning how to use it. it seems to lacks the facility of automatic line numbering and renumbering.*

*Have these subjects ever been featured in* Atari User? – **D.M. Hill, Stranraer.**

● In the August 1987 issue we published a utility to renumber Basic programs. It creates an autoboot disc or cassette file that loads into memory and remains resident until the power is turned off. We hope to cover auto line numbering in a future issue.

## Getting it quite right

*I'VE just typed in your excellent new Get–It–Right II checksum program, and I think it's really good. I especially like being able to call it up instantly rather than having to LIST and ENTER everything.*

*However, I can't seem to make it checksum itself correctly – either with the old or new versions. Both give me the same error lines – 130 and 3010. On GIR II I also get the wrong cumulative check digit from line 130 onwards.*

*Since these are only PRINT lines and the program seems to work fine, I wasn't too worried – but I have checked the spacing of each line very carefully and I still can't get it to give the right checksum.*

*I'm wondering – is it me, or are the checksums printed correct or not?* – **Michael Hayston, Aston, Birmingham.**

● *Andre Willey replies:* Some of you have noticed that the two checksums printed alongside the Basic version of my Get It Right II program didn't quite match the listing.

This was rather embarrassing and caused by a printing error which meant that two lines of the program containing inverse video text were inadvertently printed as normal characters.

On line 130 the text inside the quotes should have been shown as inverse video, including one extra inverse space on either side of the wording. Similarly line 3010 should also have had the whole of its PRINT text string in inverse video.

The program will still work quite correctly without either of these changes, of course, but it did mean that the checksum values for these lines didn't match.

Both checksums were printed out from my original program listing before the printers omitted the inverse text.

So in fact the checksums are both correct it's the listing that's wrong. I'm sorry for any confusion caused.

## Basic facts in Basics

*I AM a new Atari owner and I borrowed a book on Basic from a friend who owns another make of computer. When I type in some of the programs I get error messages, though I'm certain I have made no mistakes when typing them in.*

*Could you please explain to me what is going on? Is there some secret to typing*

*in programs out of books?* – **Richard Lawson, Heaton Mersey, Stockport.**

● All Basics are different, although most are based on a dialect of the language developed by the Microsoft Corporation. Nearly all publications outside those dedicated purely for your computer feature programs written in the most common style of Basic available.

Unfortunatly, Atari Basic differs from most of these, so you will have to modify the program listings to a style that Atari Basic will accept.

## Computer comparison

*CAN you please explain the difference between the 800XL and the new 65XE computer. Is the 65XE as reliable and can it do all the things the 800XL can do?*

*At £99 it sounds a very good buy and if it can do all the things the 800XL can do it will be a good starter pack.* – **J. L. White, Hawarden, Clwyd.**

●The 65XE computer and the 800XL are very similar to each other. The major differences occur in the physical design and layout of the micro. On the 800XL the cartridge socket is on the top, but on the 65XE it is positioned at the rear.

The parallel bus that featured on the 800XL is not on the 65XE, nor does it have the expansion bus that appeared on the 130XE.

## Serious searches

*I RECENTLY started writing a database program to store my friends' names and addresses on my Atari 800XL.*

*The main program proved no problem, but when it came to writing a routine to search through the names to find one individual surname, the program slowed down to almost snail's pace. Could you give me any help on this matter?* – **Alexander Brook, Cheadle Hulme, Cheshire.**

● When searching through the surnames there is, as usual, a slow way and a quick way. The slow way is the most obvious – you start at the first entry number and continue until you find the one you're looking for.

This is an obvious way, but rather tedious. You certainly wouldn't work that way if you were looking up a phone number in the directory, would you?

A much faster method is to open the book in the middle and decide whether you've got to go forward or back. By looking at just one name you've already eliminated half the directory.

If you then turn to the middle of the section you now know the entry's in, and again decide whether it's above or below the one you've selected, you will have quartered the book – and so on until you find the name you're after.

Using this method the computer could find any one item in an ordered list of 1000 by looking at just 10 entries.

This system is known as a binary chop, because each successive test chops the remainder of the list in half.

Following this method you should have no problem in speeding up the search routine, and the coding for it is relatively simple.

## Right lines for fault

*THANK you for a great magazine, and thanks also for my copy of Sprong by Red Rat software that I won in your birthday competition. I was very pleased with it.*

*In the November 1987 issue of* Atari User *you published the listing for Greedy Gunther.*

*After I had completed the first screen the program was in the process of drawing the second when it came up with an ERROR 8 at line 3010. After checking line 3010 I found it to be correct. Could you please help me?* – **Michael Davies, Braintree, Essex.**

● The error that the program is encountering is not actually at line 3010, but is in fact located between lines 3696 to 3890. You will probably find that you have entered one or more of the data statements incorrectly. Check these lines very carefully and you should find your error.

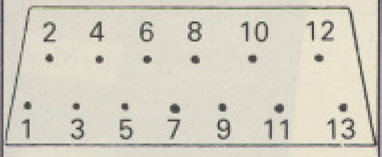
## Pin-outs in the 800XL

*FOR a while now I have had an interest in the field of electronics and computers. I have built many of the gadgets that have appeared in* Atari User, *but I now wish to design and build my own hardware modifications for my 800XL.*

*Most pin-outs for the connectors on my Atari have been readily available, but I have found it impossible to get the any details for the serial I/O connector on the rear.*

*I would appreciate it very much if you could help me.* – **Philip Marsh, Hammersmith, London.**

● Here is a diagram of the pin-outs for the serial I/O connector:




Serial I/O jack

1. Clock input
2. Clock output
3. Data input
4. Ground
5. Data output
6. Ground
7. Command
8. Motor control
9. Proceed
10. +5/ready
11. Audio input
12. +12 volts
13. Interrupt

## Differing TV systems

*THE other day I was reading an American magazine for the Atari 8 bit computers and was intereted when it started making comments about the PAL and NTSC television systems.*

*Could you please explain the differences between the two and why would this affect the Atari computers?* – **Pamela Benjamin, Warrington, Cheshire.**

● The PAL system is one of the European television standards that we use. It has a 50Hz frame rate and uses 312 lines per frame to build a picture on the screen.

The NTSC system is the American equivalent to PAL. However, it only uses 262 lines per frame to build a picture and uses a faster frame rate of 60Hz.

This means that although the screen is up-dated faster on the American television, the picture quality is not as good as that achieved by PAL.

Atari computers were initially designed around the NTSC system, but when they were sold in Europe a hardware modification was made so they would be compatible with the PAL system. So, the difference in the way the two systems work will not directly affect your own micro.

# Enter the magical world of Kerovnia!




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This fascinating adventure features the most sophisticated parser around: You can type complex sentences and interact with the many characters, including some very intelligent animals.

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"The program took three man years of programming time to produce – and it shows. The Pawn is the stuff from which cults are made."

***– Anthony Ginn, Atari User, May 1986***







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# Guild of Thieves – it's a steal!

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There are 29 beautiful illustrations, a massive vocabulary, and a text parser which is claimed to be more sophisticated than the parser in the Infocom adventures.

"This is an absorbing, funny and tantalising adventure and guaranteed to be another sure-fire winner for Rainbird."

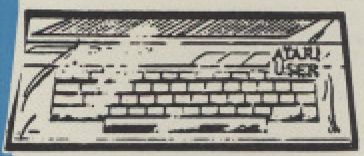
***– Bob Chappell, Atari User, October 1987***

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| | Guild of Thieves | Disc | £19.95 | £14.95 | £5 | £24.95 | £10 |

TO ORDER PLEASE USE THE FORM ON PAGE 61

12/87.6

## *Protect your Atari .*

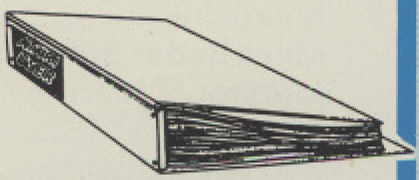


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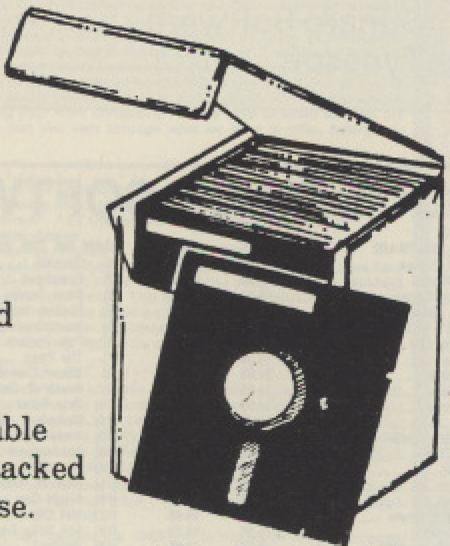
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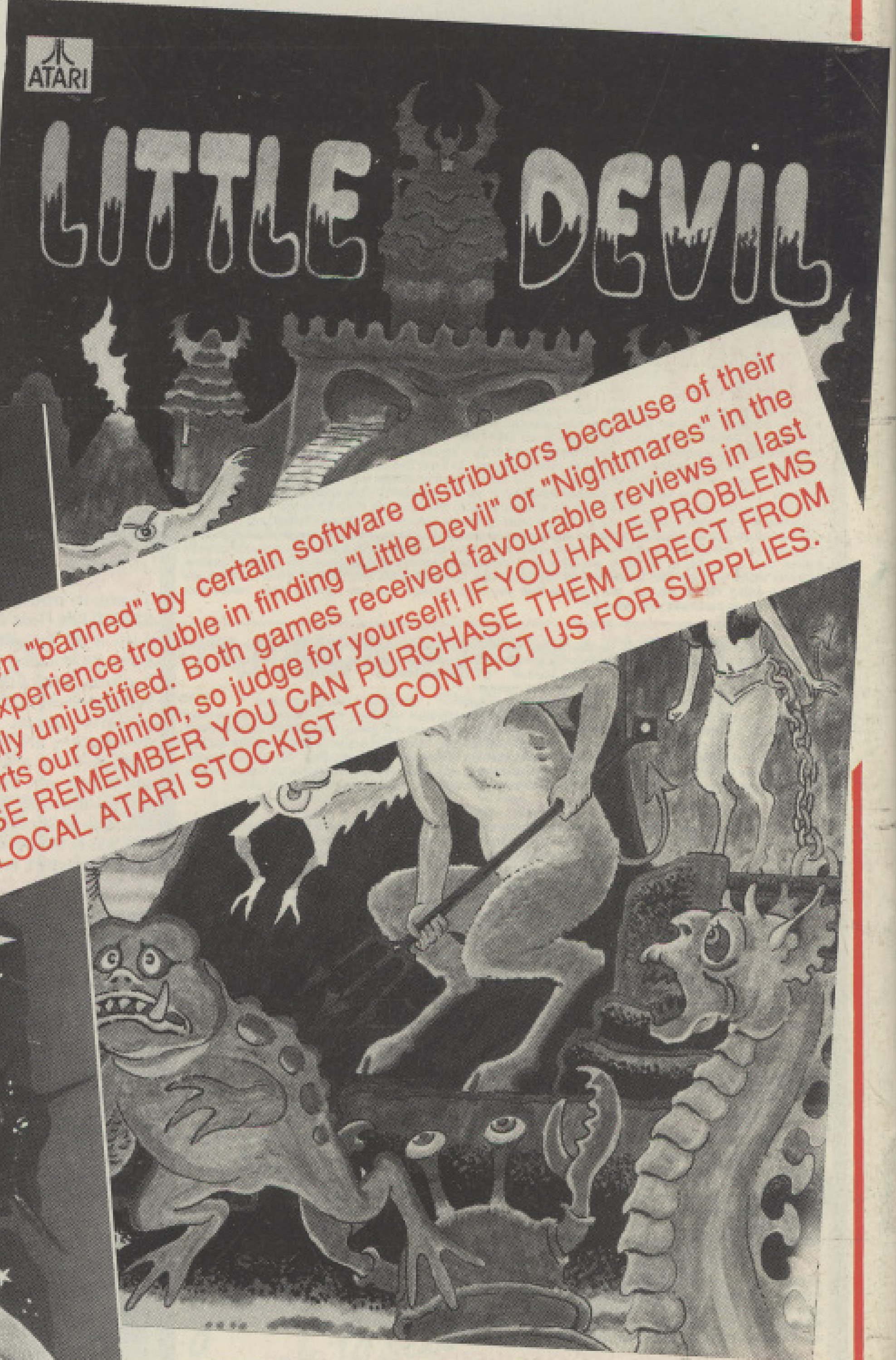
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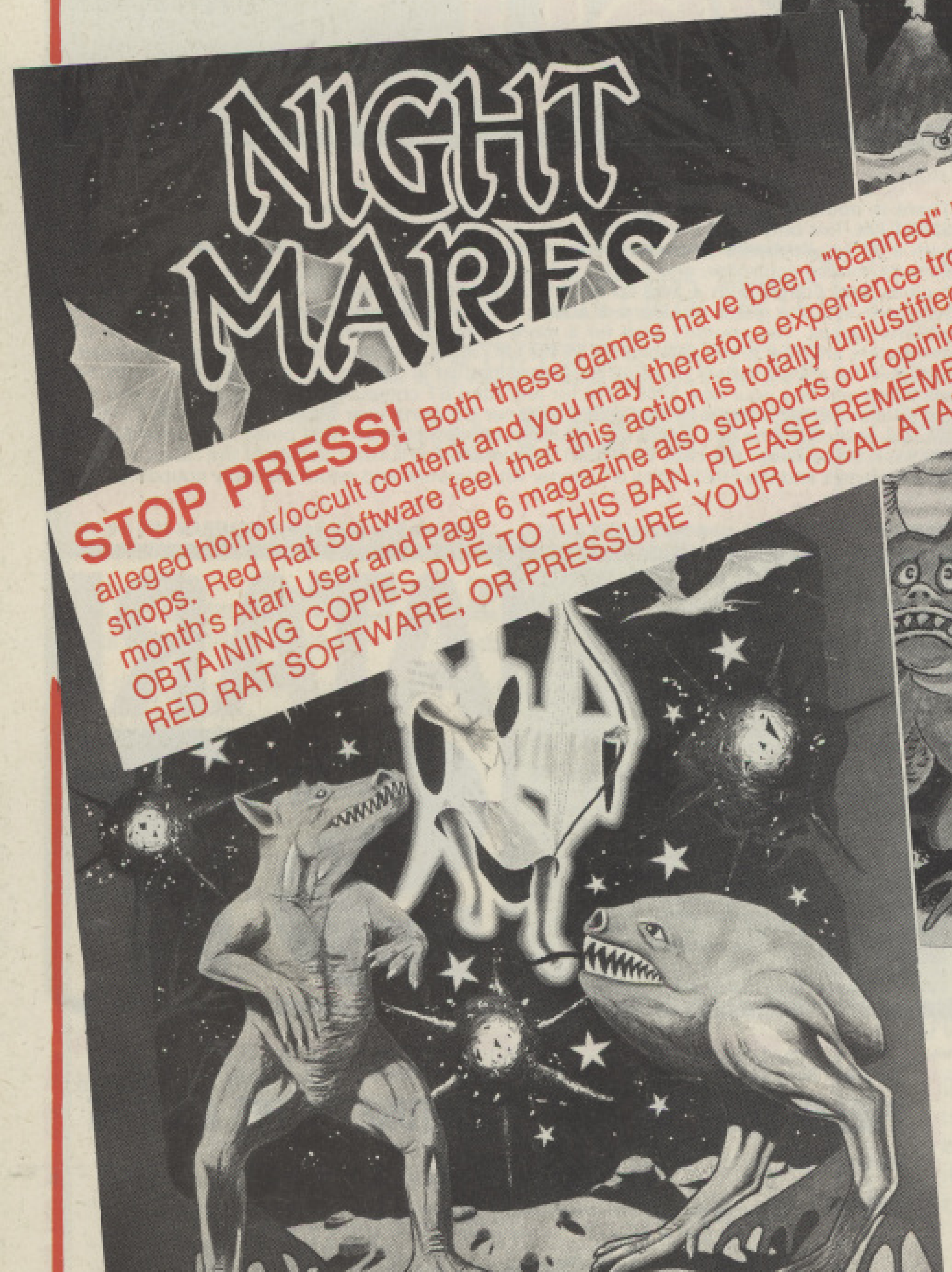
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